Vol. 934 Number 4

OFFICIAL GAZETTE

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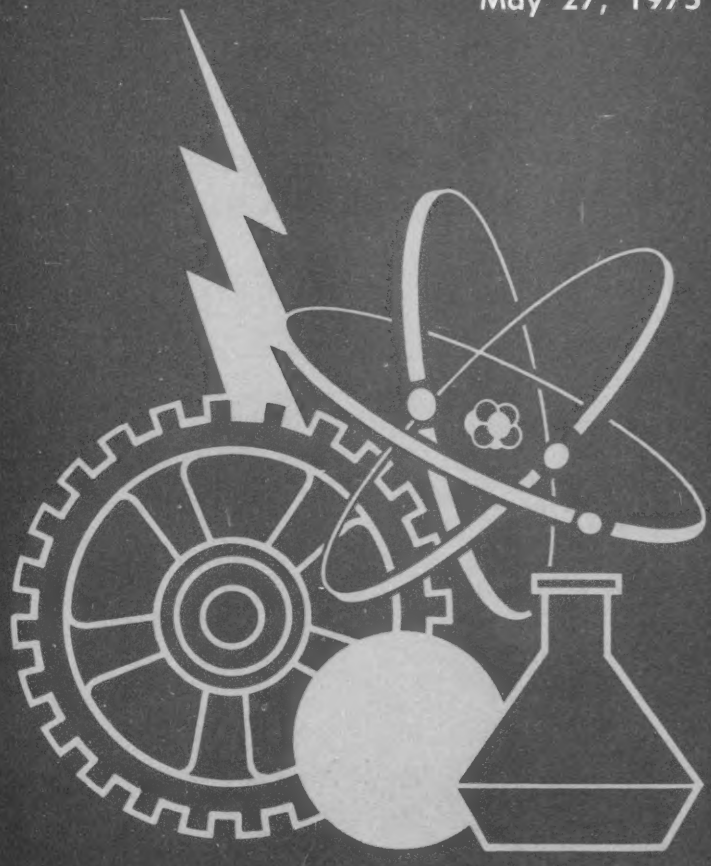

U.S. DEPARTMENT OF COMMERCE

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UNITED STATES PATENT and TRADEMARK OFFICE

May 27, 1975 Volume 934 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

WIPO Vacancy

WIPO has announced its intention to fill a vacancy in the position of Director of its External Relations Division. Incumbent's duties will include: relations with WIPO member and non-member States and international organizations; representation at international meetings; implementation of the legal technical assistance program; and the preparation of working documents and reports.

The qualifications required are: a law degree; experience in international intellectual property activities; familiarity with procedures of the U.N.; ability to act as WIPO representative at international meetings; and excellent knowledge of either French or English and a working knowledge of the other language.

The candidate must be less than 55 or 60 years of age depending upon the type of appointment.

The annual salary ranges from 57,717 Swiss Francs to 66,598 Swiss Francs. Post adjustments, on an annual basis range from 30,623 Swiss Francs to 33,933 Swiss Francs, without dependents; from 45,934 Swiss Francs to 50,900 Swiss Francs, with dependents. Applications and information on WIPO Competition No. 269 can be obtained from the Director of Administrative Division, World Intellectual Property Organization (WIPO) 32, chemin des Colombettes, 1211 Geneva 20, Switzerland. Closing date for receipt of applications is June 16, 1975.

C. MARSHALL DANN,
May 2, 1975. *Commissioner of Patents and Trademarks.*

Examination

Pursuant to the provisions of Rule 341(c), an examination for persons seeking registration before the United States Patent & Trademark Office as patent attorneys or agents will be held on Tuesday, September 9, 1975.

With the exception of those former patent examiners for whom the examination is waived, all persons recognized for practice before the Patent & Trademark Office in patent cases must, pursuant to the noted rule, pass the examination. Those passing the examination do not thereby qualify for recognition for practice before the Patent & Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by Rule 2.12 of the Trademark Rules of Practice, which does not require the passing of an examination.

The examination will be given under the supervision of the Civil Service Commission, and may be taken in any of the cities in which the Civil Service Commission regularly conducts examinations. Application to take the examination must be filed in the Patent & Trademark Office together with a $35 fee not later than July 31, 1975.

Application blanks may be obtained from the Clerk of the Patent & Trademark Office Committee on Enrollment, Bldg. 3, 11th Floor, Room C16, Crystal Plaza, Arlington, Va., or by mail addressed to the Commissioner of Patents & Trademarks, Washington, D.C. 20231, and directed to the attention of the Clerk of the Committee on Enrollment.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,742,327, T. Marks, FULLY AUTOMATIC MACHINE FOR MAKING BRUSHES, **filed** Oct. 6, 1970, D.C., S.D.N.Y., Doc. 70–C–4312, *American Technical Industries, Inc.* v. *Premier Decorations, Inc. et ano.* Final judgment and order that the provisions of this final judgment shall apply to the defendants. The defendants are restrained from contesting, directly or indirectly, the validity of said patent owned by the plaintiff, Oct. 27, 1972.

2,755,623, Ferri and Schwartz, ROTATING FLOW COMBUSTOR, **filed** Sept. 26, 1972, D.C. Conn. (New Haven), Doc. 15567, *Antonio Ferri, Ira R. Schwartz* v. *United Aircraft Corporation et al.* Consent final judgment dismissing the complaint on the merits, entered Aug. 13, 1974.

2,857,752, Anderson, Dell and Nelson, FLASH LAMP; **2,982,119,** R. M. Anderson, same; **3,016,727,** Vanden Boom and Anderson, same; **3,064,457,** Vanden Boom and Jakubs, MULTI-LAMP UNIT; **3,123,993,** Cressman and Demchock, FLASH LAMP, **filed** Mar. 3, 1969, D.C., S.D.N.Y., Doc. 69–C–842, *General Electric Company* v. *Morritz Broker, individually, and doing business as Hattizlachh Photo Supply Co.* Filed final judgment and consent decree. The defendants' counterclaims are dismissed without prejudice. Defendants are jointly enjoined and severally enjoined from selling covered products, Oct. 7, 1970.

2,902,784, D. R. Sukul, ROOM SERVICE INDICATOR, **filed** Dec. 18, 1973, D.C. Del. (Wilmington), Doc. 4778, *Lily D'Auguiar* v. *Mariott Corporation.* Stipulation of dismissal with prejudice, Oct. 25, 1974.

2,906,875, E. T. Molinaro, STATION SAMPLING RADIO, **filed** Sept. 26, 1974, D.C.N.J. (Trenton), Doc. C–74–1492, *Anthony P. Cantanzaro* v. *Fannon/Courier Corp.*

2,908,831, G. Hirsch, SPIT DRIVE UNITS, **filed** Oct. 13, 1971, D.C., S.D.N.Y., Doc. 71–C–3119, *Brevel Products Corp.* v. *Buddy L Corporation.* Filed stipulation and order dismissing the action without prejudice, Dec. 12, 1972.

2,982,119. (See 2,857,752.)

3,002,176, R. S. Yopp, MULTIPLE-CONTACT ELECTRICAL CONNECTOR, **filed** Feb. 1, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c316, *Bunker Ramo Corp.* v. *AMP Inc. et al.* Stipulated order dismissing complaint with prejudice and defendants' counterclaim is dismissed without prejudice, Aug. 8, 1974.

3,016,727. (See 2,857,752.)

3,022,701, R. A. Potruch, PLASTIC ANCHOR-TYPE FASTENER AND DRIVER MEANS FOR EXPANDING SAME, **filed** Aug. 24, 1967, D.C., S.D.N.Y., Doc. 67–C–3251, *U.S. Expansion Bolt Company* v. *Star Expansion Industries, Inc. et ano.* Stipulation and order dismissing complaint and counterclaims with prejudice, Oct. 31, 1974.

3,040,993, E. J. Schultz, LIGHTING FIXTURE, **filed** June 26, 1970, D.C., S.D.N.Y., Doc. 70–C–2737, *Esco Lighting Co., Inc.* v. *Lighting Services, Inc.* Filed judgment dismissing complaint, Apr. 4, 1973.

3,063,457, Bittner and Gnass, FOOT EXERCISER SANDALS, **filed** Aug. 14, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2302, *Scholl, Inc.* v. *S.S. Kresge Company.*

3,064,457. (See 2,857,752.)

3,094,278, B. Kuhne, DETENT TYPE ACTUATOR FOR CALCULATING MACHINE, **filed** May 22, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–1417–R, *Addmaster Corp.* v. *Unitrex of America, Inc.*

3,123,993. (See 2,857,752.)

3,150,216, W. Z. Salcer, METHOD FOR MAKING PLASTIC ARTICLES, **filed** Sept. 28, 1964, D.C.N.J. (Newark), Doc. 905–64, *B & S Plastic Art, Inc.* v. *Efka Plastic Corporation et al.* Judgment on counterclaims in favor of defendant, Efka Plastic Corporation, Sept. 27, 1974.

3,160,671, Feigelman and Aristoff, METHOD FOR INCREASING THE YIELD OF RECOVERABLE MONOCYCLIC AROMATIC HYDROCARBONS IN THERMAL HYDRODEALKYLATION PROCESSES, **filed** Aug. 3, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c1985, *Atlantic Richfield Company* v. *Phillips Petroleum Company.* Order cause dismissed with prejudice and without costs with leave to reinstate in sixty days, Dec. 21, 1973.

3,166,693, Haring and Taylor, DRY ELECTROLYTIC DEVICE, **filed** Oct. 28, 1969, D.C. Ariz. (Phoenix), Doc. C–69–467–Phx, *Western Electric Company, Inc.* v. *Dickson Electronics Corporation.* Stipulation of dismissal and order of court approving same, Jan. 17, 1975.

3,402,657, Potter, Foley and Antonucci, HIGH SPEED BELT PRINTER WITH PRINTING SLUG SUPPORTING MEANS; **Re. 26,240,** C. I. Wasserman, HIGH SPEED PRINTERS WITH COLUMN SPANNING HAMMERS, **filed** Mar. 8, 1974, D.C. Mass. (Boston), Doc. 74–1081, *Potter Instrument Company, Inc.* v. *Odec Computer Systems, Inc.* The order of the District Court is affirmed, June 27, 1974.

3,473,091, Morris and McDonald, GROUND LEAKAGE DIFFERENTIAL PROTECTIVE APPARATUS; **3,506,906,** D. W. Nestor, GROUND FAULT CIRCUIT INTERRUPTER WITH INADVERTENT GROUND SENSOR, **filed** Nov. 15, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c2744, *Harvey Hubbell, Inc.* v. *Rucker Co. et al.* Enter order, stipulation to dismiss without prejudice granted, June 15, 1973.

3,483,617, J. Krampe, TOOL FOR CUTTING AND STRIPPING CABLE, **filed** Jan. 8, 1974, D.C., N.D. Ill. (Chicago), Doc. 71c47, *Joseph Krampe* v. *Ideal Industries, Inc.*

3,495,629, Botsolas and Lionikis, METHOD AND DEVICE FOR COVERING PIPEFITTINGS, **filed** June 8, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70–1266–FW, *Chris J. Botsolas* v. *Schultz Laboratories et al.* Final judgment, defendants are enjoined and restrained from infringing and contributorily infringing said patent. In particular, defendant and Mesa Plastics Company, Inc. are hereby enjoined and restrained from the sale or transfer of the molds from which the infringing pipefitting cover products were made, Aug. 22, 1974. **Same, filed** Mar. 22, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–770 WPG, *Johns-Manville Corporation* v. *Certain-Teed Products Corporation.* **Same, filed** May 3, 1974, D.C., S.D.N.Y., Doc. 74–C–1926 (CLB), *Certain-Teed Products Corp.* v. *Johns-Manville Corp.*

3,499,302, Spain, Oliver, Flora and Powell, CYLINDER LOCK, **filed** June 26, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1752, *Medeco Security Locks, Inc.* v. *Lock Technology Corp.*

3,499,481, W. C. Avrea, PRESSURIZED LIQUID COOLING SYSTEM; **3,601,181,** same, METHOD APPARATUS FOR PURGING AIR FROM INTERNAL COMBUSTION ENGINE COOLING SYSTEMS, **filed** Apr. 9, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–935–JWC, *Orion Industries, Inc.* v. *Saf-Gard Products, Inc.* Filed order granting defendant's motion dismissing plaintiff's complaint with prejudice, entered Oct. 11, 1974.

3,506,906. (See 3,473,091.)

3,517,989. C. H. Wilson, SPECTACLES, **filed** Mar. 27, 1973, D.C., S.D.N.Y., Doc. 73–1270, *Rayex Corporation* v. *Foster Grant Co. Inc.* Filed order of dismissal pursuant to Rule 41(a)(1), Aug. 31, 1973.

3,543,019, J. Jacobsen, EQUIPOISED LAMP, **filed** Sept. 17, 1974, D.C. Colo. (Denver), Doc. 74–M–852, *Luxo Lamp Corporation* v. *May D & F Company of Colorado.*

3,582,084, Ryan and Chang, DEVICE FOR REPRODUCING RECORDED SOUNDS IN TOYS, **filed** Oct. 18, 1971, D.C., S.D.N.Y., Doc. 71–C–4536, *Mattel, Inc.* v. *Ideal Toy Corporation.* Filed stipulation and order of dismissal without prejudice, Sept. 12, 1973.

3,601,181. (See 3,499,481.)

3,610,733, F. G. Back, VARIFOCAL LENS SYSTEM AND ACTUATING MECHANISM, **filed** July 31, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV 74–2201–IH, *Zoomar, Inc. and Frank B. Back* v. *Taisei Kogaku Kogyo Co. et al.*

3,632,879, R. Freisinger, AUTOMATIC TELEPHONE DIALER FOR EMERGENCY MESSAGES, **filed** June 3, 1972, D.C.N.J. (Newark), Doc. C 964–72, *Atlantic Metal Products Inc.* v. *Napco Security Systems Inc.* Consent order of dismissal of action, June 26, 1974.

3,670,611, D. J. Jarman, SHEAR DISCHARGE CONVEYING SYSTEM; **3,793,916,** same, FEEDBACK CONVEYOR SYSTEM, **filed** Nov. 4, 1974, D.C., N.D. Tex. (Dallas), Doc. CA3–74–1084–C, *Continental M.D.M., Inc.* v. *Spaulding Incorporated.*

3,687,467, W. B. Kosmowski, COLLET, **filed** Apr. 6, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–762–R, *Digital Systems, Inc.* v. *Advanced Controls Corporation.* Filed defendant's and counterclaimant's notice of dismissal with prejudice, entered Oct. 24, 1974.

3,702,701, Vaughn and Hargrave, METAL TENNIS RACKET WITH PLASTIC THROAT PIECE AND MOLDED PLASTIC HANDLE, **filed** July 2, 1974, D.C.N.J. (Trenton), Doc. C–74–1008, *Maark Corporation* v. *J. C. Penney.*

3,712,772, D. B. Hunkar, CONTROL SYSTEM FOR PARISON EXTRUDERS, **filed** Oct. 19, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2693, *Hunkar Laboratories, Inc.* v. *Bekum-Maschinenfabriken GmbH.* Filed letter from plaintiff's attorney Kenneth C. Miller which should be treated as a notice pursuant to F.R.C.P. 71(a)(1), Nov. 20, 1973.

3,793,916. (See 3,670,611.)

3,795,117, Moody, Jr. and Hamilton, INJECTION COOLING OF SCREW COMPRESSORS, **filed** Aug. 19, 1974, D.C., M.D. Pa. (Scranton), Doc. 74–682, *Dunham-Bush, Inc.* v. *Freezing Equipment Sales, Inc.*

3,805,724, F. W. Butler, SAILBOAT CANOPY APPARATUS, **filed** Nov. 1, 1974, D.C.S.C. (Columbia), Doc. 74–1699, *Frank W. Butler and Catalina Yachts, Inc.* v. *Jack A. Helms, doing business as Jack A. Helms Company.*

3,806,312, McMaster and Nitschke, ROLLER HEARTH FURNACE, **filed** Aug. 20, 1974, D.C. Mass. (Boston), Doc. 74–4085–T, *Glasstech, Inc. et al.* v. *Guardian Industries Corp.*

3,810,604, J. A. Reiter, TANK AGITATING AND CLEANING SYSTEM, **filed** Aug. 27, 1974, D.C. N. Mex. (Albuquerque), Doc. C–74–416, *Tanks, Inc.* v. *Reiter Industries, Inc.*

3,816,964, J. Catalano, WINDOW GUARD, **filed** Sept. 6, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c2559, *Joseph Catalano* v. *Kaweneer Company, Inc.*

3,832,837, Burkhart, Fell and Case, WINDROWER HAVING REAR MOUNTED OVERTOP SWINGABLE TONGUE; **D. 228,010,** same, COMBINED MOWER, CONDITIONER AND WINDROWER, **filed** Sept. 13, 1974, D.C. Kans. (Wichita), Doc. 74–185–C6, *Hesston Corporation* v. *Deere and Company.* **Same, filed** Sept. 16, 1974, D.C. Kans. (Wichita), Doc. 74–188–C6, *Hesston Corporation* v. *John Deere Company.*

Re. 25,570, J. H. Lemelson, EXTRUSION APPARATUS, **filed** Aug. 13, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2074, *Discovery Rights, Inc.* v. *American Can Company.* Enter order to voluntarily dismiss action without prejudice, Oct. 25, 1973.

Re. 26,240. (See 3,402,657.)

D. 207,227, K. Solheim, GOLF PUTTER, **filed** Apr. 12, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–982RJK, *Karsten Manufacturing Corp. and Karsten Solheim* v. *Link & Pan Enterprises Limited.* Filed stipulation and order thereon enjoining defendant from making or selling a putter which infringes said design patent. Plaintiff's cause of action against defendant is dismissed, entered Oct. 30, 1974.

D. 288,010. (See 3,832,837.)

D. 232,601, Rich and Rich, MOLDED POULTRY PRODUCT; **Reg. No. 905,938** (RICH'S CATERING), Louis Rich Foods, Inc.; **Reg. No. 927,455** (CATERING QUALITY RICH'S AND DESIGN), same, **filed** Oct. 31, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–3154, *Louis Rich, Inc.* v. *Harry V. Priester, doing business as Poultry Distribution Co.*

Reg. No. 905,938. (See D. 232,601.)

Reg. No. 927,455. (See D. 232,601.)

Certificates of Correction for the Week of May 27, 1975

P.P. 3,594	3,840,479	3,863,729	3,870,078
Re. 27,848	3,840,622	3,864,095	3,870,461
Re. 28,317	3,841,967	3,864,128	3,870,689
D. 234,046	3,842,160	3,864,274	3,870,828
3,537,883	3,845,028	3,864,314	3,871,115
3,647,742	3,845,636	3,864,331	3,871,140
3,650,657	3,846,532	3,864,481	3,871,209
3,662,062	3,847,544	3,864,579	3,871,413
3,679,421	3,849,396	3,864,901	3,871,436
3,736,239	3,849,833	3,865,167	3,871,494
3,736,544	3,849,918	3,865,397	3,871,863
3,749,103	3,851,844	3,866,118	3,871,882
3,770,053	3,852,018	3,866,146	3,871,903
3,783,102	3,853,757	3,866,278	3,872,387
3,785,356	3,854,458	3,866,430	3,872,438
3,785,833	3,855,285	3,866,516	3,872,547
3,799,237	3,855,628	3,866,611	3,872,599
3,802,369	3,856,061	3,866,691	3,872,645
3,807,960	3,856,139	3,866,804	3,872,685
3,809,030	3,856,637	3,866,829	3,872,940
3,810,944	3,857,429	3,867,155	3,873,239
3,815,042	3,857,728	3,867,161	3,873,333
3,815,099	3,857,851	3,867,278	3,873,417
3,816,245	3,859,243	3,867,342	3,873,475
3,816,587	3,859,250	3,867,546	3,873,503
3,816,717	3,859,617	3,867,579	3,873,504
3,816,763	3,859,733	3,867,592	3,873,581
3,818,232	3,859,951	3,867,653	3,873,745
3,819,443	3,860,360	3,867,729	3,873,858
3,820,371	3,860,499	3,867,915	3,873,889
3,823,767	3,860,580	3,868,100	3,874,090
3,824,428	3,860,697	3,868,220	3,874,403
3,824,601	3,861,272	3,868,295	3,875,098
3,825,443	3,861,796	3,868,431	3,875,122
3,831,058	3,861,902	3,868,967	3,875,225
3,837,979	3,862,119	3,869,282	3,876,147
3,838,633	3,862,483	3,869,724	3,876,617
3,839,359	3,863,272	3,869,728	
3,839,932	3,863,461	3,869,898	
3,840,074	3,863,570	3,869,920	

Dedication

2,809,651.—*Sigurd M. Moberg,* Pompton Plains, N.J. NON-REUSABLE DEVICE FOR CLOSING A FLEXIBLE TUBE. Patent dated Oct. 15, 1957. Dedication filed Feb. 9, 1972, by the assignee, *E. J. Brooks Company.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

3,406,622.—*Hans Gotz,* Backnang-Stockenhof, Germany. VENTILATION MEANS FOR PASSENGER MOTOR VEHICLES. Patent dated Oct. 22, 1968. Disclaimer and dedication filed July 28, 1972, by the assignee, *Daimler-Benz Aktiengesellschaft.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

Availability of Patent Application Drawings for Reproduction

Clients of private commercial reproduction services requesting patent application drawings to make drawing reproductions for U.S. and foreign filings have caused printing problems and delays in allowed applications in which the Base Issue Fee has been paid.

In order to prevent any delay in the printing and issuance of applications in which the Base Issue Fee has been paid, access to the drawings of patent applications which have been scheduled for printing will not be normally available. Delays in obtaining patent application drawings by commercial reproduction services, after the application has been scheduled for printing, can be avoided if requests for reproductions are made either before or promptly after receipt of the Notice of Allowance and prior to the payment of the Base Issue Fee.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

May 6, 1975.

Official Gazette—Advance Announcement Notice

On June 3, 1975 a questionnaire in the form of a return Postal Card (Form PTO Temp. 218) will be placed in each copy of the OFFICIAL GAZETTE. The purpose of the questionnaire is to determine if more economic alternatives to the present OFFICIAL GAZETTE (Patents Section) subscription rate are acceptable.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Date : Apr. 30, 1975.

Disclaimers

Re. 27,492.—*Carl Franklin Wheatley, Jr.,* Somerset, N.J. TELEVISION DEFLECTION SYSTEM INCLUDING AFC CIRCUIT WITH REGENERATIVE PHASE DETECTOR. Patent dated Sept. 26, 1972. Disclaimer filed Mar. 27, 1974, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 9, 10, 11, 12, 13 and 14 of said patent.

Re. 27,533.—*Eugene B. Cox,* Fairfield, Conn. IMPREGNATED DIELECTRIC SYSTEMS. Patent dated Dec. 26, 1972. Disclaimer filed Dec. 5, 1973, by the assignee, *General Electric Company.*

Hereby disclaims the portion of the term of the patent subsequent to Jan. 9, 1985.

Design No. 200,165.—*Daniel Dorfman,* Woodbury, N.Y. COMBINE Patent dated Jan. 26, 1965. Disclaimer filed Feb. 4, 1972, by the assignee, *Lawn-A-Mat Chemical & Equipment Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,511,464.—*Brendan L. Doll,* Patterson, N.C. CORNER PAD AND BLANK. Patent dated May 12, 1970. Disclaimer filed Oct. 3, 1972, by the assignee, *Cellu Products Company.*

Hereby enters this disclaimer to claim 6 of said patent.

3,596,071.—*George I. Doering,* Columbus, Ohio. METHOD AND APPARATUS FOR A MATERIAL TREATER. Patent dated July 27, 1971. Disclaimer filed July 12, 1974, by the assignee, *Industrial Nucleonics Corporation.*

Hereby enters this disclaimer to claims 3, 5, 7, 8, 9, 11, 12, 13, 14, 16, 25 and 26 of said patent.

3,600,705.—*Wirojana Tantraporn* and *Se Puan Yu,* Schenectady, and *Paul J. Shaver,* Scotia, N.Y. HIGHLY EFFICIENT SUBCRITICALLY DOPED ELECTRON TRANSFER EFFECT DEVICES. Patent dated Aug. 17, 1971. Disclaimer filed Aug. 29, 1974, by the assignee, *General Electric Company.*

Hereby enters this disclaimer to claims 1, 2, 6, 12 and 15 of said patent.

3,620,010.—*Richard K. Davis,* Roanoke, Va. GAS TURBINE SPEED-LOAD CONTROL. Patent dated Nov. 16, 1971. Disclaimer filed Dec. 5, 1973, by the assignee, *General Electric Company.*

Hereby enters this disclaimer to all claims of said patent.

3,643,107.—*Dennis R. Gilbreath*, New Haven, Conn. FUNCTION GENERATOR. Patent dated Feb. 15, 1972. Disclaimer filed Nov. 23, 1973, by the assignee, *United Aircraft Corporation*.

Hereby enters this disclaimer to claims 1–8, inclusive, of said patent.

3,646,346.—*Kevin J. Catt*, Melbourne, Australia. ANTIBODY-COATED TUBE SYSTEM FOR RADIOIMMUNOASSAY. Patent dated Feb. 29, 1972. Disclaimer filed Oct. 31, 1974, by the assignee, *Pharmacia AB*.

Hereby enters this disclaimer to all claims of said patent.

3,646,955.—*Jarl Rune Olde*, Uppsala, Sweden. WATER-FEEDING DEVICE. Patent dated Mar. 7, 1972. Disclaimer filed May 31, 1974, by the inventor.

Hereby enters this disclaimer to claim 1 of said patent.

3,665,403.—*John J. Igel*, Rochester, and *Myron D. Schettl*, Oronoco, Minn. DATA RECORDER AND VERIFIER. Patent dated May 23, 1972. Disclaimer filed July 1, 1974, by the assignee, *International Business Machines Corporation*.

Hereby enters this disclaimer to claims 5, 6, 8, 9, 10 and 12 through 15 of said patent.

3,683,991.—*Felix H. Ruhland*, Osseo, and *Raymond H. Schmidt*, Buffalo, Minn. IMPROVED TIRE BEAD SEATER. Patent dated Aug. 15, 1972. Disclaimer filed Oct. 29, 1973, by the assignee, *Solar Industries, Inc.*

Hereby enters this disclaimer to claims 1–8 of said patent.

3,702,866.—*Sigbjorn Salvesen*, *Leif Gunnar Haugen*, *Johan Haavaldsen* and *Vegard Nordal*, Oslo, Norway. NOVEL 3,5 - BIS - ACYLAMIDO - 2,4,6 - TRIIODOBENZOIC ACIDS AND 5 - ACYLAMIDO - 2,4,6 - TRIIODOISOPHTHALAMIC ACIDS. Patent dated Nov. 14, 1972. Disclaimer filed July 9, 1974, by the assignee, *Nyegaard & Co. A/S*.

Hereby enters this disclaimer to all claims of said patent.

3,774,694.—*Donovan Karnes* and *Marion F. Centliver*, Troy, Ohio. APPARATUS FOR MOVING WIRE. Patent dated July 10, 1973. Disclaimer filed Oct. 18, 1973, by the assignee, *Hobart Brothers Company*.

Hereby enters this disclaimer to claim 28 of said patent.

3,748,138.—*Vernon L. Bissonette*, Brockport, N.Y. METAL COMPLEX IN SILVER HALIDE DEVELOPMENT. Patent dated July 24, 1973. Disclaimer filed July 1, 1974, by the assignee, *Eastman Kodak Company*.

Hereby enters this disclaimer to claims 3 through 5, 9 through 12, and 15 of said patent.

3,765,603.—*Donald E. Bean*, *James T. Engh*, *James R. Hammer*, and *John J. Igel*, Rochester, *Myron D. Schettl*, Oronoco, and *Harry J. Tashjian*, *Richard J. Ullmer*, and *John W. Kerr*, Rochester, Minn. DATA RECORDER AND VERIFIER. Patent dated Oct. 16, 1973. Disclaimer filed July 1, 1974, by the assignee, *International Business Machines Corporation*.

Hereby enters this disclaimer to claim 1 of said patent.

3,833,611.—*Raphael Mechoulam*, Jerusalem, and *Shlomo Houry*, Ramat-Gan, Israel, and *Bernard Loev*, Broomall, Pa. 3,7-METHANOBENZOXONIN COMPOUNDS. Patent dated Sept. 3, 1974. Disclaimer filed Jan. 28, 1975, by the assignee, *Yissum Research Development Company*.

Hereby enters this disclaimer to claims 1–3, inclusive, of said patent.

3,857,704.—*Michael Oliver Coulter*, near Crewe, England. MERCURY RECOVERY PROCESS. Patent dated Dec. 31, 1974. Disclaimer filed Jan. 10, 1975, by the assignee, *BP Chemicals Limited*.

Hereby disclaims the portion of the term of the patent which would extend beyond Nov. 12, 1991.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 10, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-24-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-22-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-21-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-3-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-7-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-6-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-8-74
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-5-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-15-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-8-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	2-4-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-12-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-3-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-30-74
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-9-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	10-4-74

Expiration of patents: The patents within the range of numbers indicated below expire during May 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,832,959, to 2,836,825 inclusive
Plant Patents..... Numbers 1,698, to 1,713 inclusive

REISSUE PATENTS

GRANTED MAY 27, 1975

ERRATA

For CLASS	See PATENT NO.
417–295	28,428
425–169	28,430
308–235	28,431
330–207	28,432
060–632	28,434

REISSUES

MAY 27, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,428

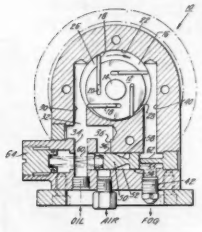
PUMP PRIMING AND FLOW CONTROL VALVE FOR PUMPING TWO DIFFERENT FLUIDS

Paul H. Reeve, River Vale, N.J., by Auto Research Corporation, Rochelle Park, N.J., assignee

Original No. 3,671,148, dated June 20, 1972, Ser. No. 110,024, Jan. 27, 1971. Application for reissue Dec. 19, 1973, Ser. No. 426,230

Int. Cl. F04b *49/00*

U.S. Cl. 417—295 **11 Claims**



14. A pump for simultaneously pumping fluids of differing viscosities, said pump comprising,

a first inlet conduit for a fluid of a relatively lower viscosity; a second inlet conduit for a fluid of a relatively higher viscosity; a junction between said first and second inlet conduits;

pumping means communicating with said junction for pumping the fluids therefrom; an outlet conduit from said pumping means for pumping the fluids to a point of use;

a fluid-flow control valve including a movable valve-member for controlling the flow through said first conduit to said junction; a guideway in said pump for controlling the path of movement of said valve member; said first conduit intersecting said guideway at a location such that said valve member moves across said first conduit;

said valve member having one position in said guideway at which it blocks flow through said first conduit and said valve member being so shaped as to block flow through said first conduit when it is at said one position;

biasing means connected with said valve member for biasing same, in opposition to the pressure in said outlet conduit, to move in said guideway in a direction toward the said one position to thus cause said valve member to block flow through said first conduit when pressure in said outlet conduit is non-existent;

said outlet conduit communicating with said guideway in a manner such that the pressure developed in said outlet conduit by operation of said pumping means is transmitted to said valve member, which is thereby moved by said pressure from its said one position to another position in which said valve member permits flow through said first conduit;

said biasing means being so designed as to have its biasing force on said valve member increased as said valve member is moved toward said biasing means under the influence of pressure in said outlet conduit.

28,429

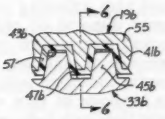
LEAD SCREW AND NUT

John W. Ballentine, Manhattan Beach, and Frank R. Chaffin, Thousand Oaks, Calif., assignors to W. S. Shamban & Co., Los Angeles, Calif.

Original No. 3,698,257, dated Oct. 17, 1972, Ser. No. 109,490, Jan. 25, 1971. Application for reissue June 10, 1974, Ser. No. 477,967

Int. Cl. F16h *1/18, 55/18*

U.S. Cl. 74—424.8 R **27 Claims**



1. An assembly comprising:

a screw member having a generally helical external rib on the exterior thereof, said rib defining a generally helical external groove;

a nut member having a passage therein, said nut member having a generally helical internal rib in said passage, said internal rib defining a generally helical internal groove;

said screw member projecting into said passage with said external rib being received in said internal groove and with said internal rib being received in said external groove whereby relative rotation between said members causes relative translation between said members;

at least a segment of said nut member being somewhat deformable;

said ribs relatively tightly engaging each other substantially without backlash; and

means for preloading said segment of said nut member both axially and radially of said nut member with sufficient force to deform said segment of said nut member to at least assist in obtaining the relatively tight engagement between the ribs.

28,430
APPARATUS FOR DETECTING BROKEN YARN IN SYNTHETIC FIBER SPINNING

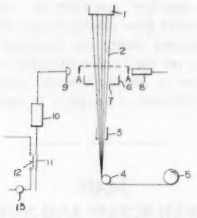
Eitaro Mukai, Yasuhiro Murase, Mitsuru Kusama, and Mitsuru Yamasaki, Matsuyama, and Takayuki Takasago, Tokyo, and Tatsumi Tanabe, Matsuyama, Japan, assignors to Teijin Ltd., Osaka, Japan

Original No. 3,618,168, dated Nov. 9, 1971, Ser. No. 811,979, Apr. 1, 1969. Application for reissue Oct. 31, 1973, Ser. No. 411,384

Claims priority, application Japan, Apr. 9, 1968, 43/23,858

Int. Cl. D01d *7/00*

U.S. Cl. 425—169 2 Claims



1. Apparatus for detecting breakage of yarn in a spinning machine including a spinneret, a guide roller receiving yarn from the spinneret along a first path of travel, and [a winder] *tensioning means* receiving yarn from the guide roller along a second path of travel, said apparatus comprising yarn [receiving] *collecting* means disposed along said first path of travel, said yarn [receiving] *collecting* means having an opening through which said yarn passes and a surface surrounding said opening for collecting yarn; and photoelectric detection means disposed adjacent said yarn collecting means and including light emitting means disposed on one side of said yarn [receiving] *collecting* means, light receiving means disposed on the other side of said yarn [receiving] *collecting* means, and means connected with said light receiving means to indicate breakage of yarn when yarn collected on said surface interferes with light received by said light receiving means from said light emitting means.

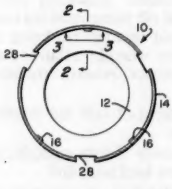
28,431
LANCED TAB RACE

Richard L. Alling and Roger L. Iffland, Torrington, Conn., assignors to The Torrington Co., Torrington, Conn.

Original No. 3,713,713, dated Jan. 30, 1973, Ser. No. 214,260, Dec. 30, 1971. Application for reissue Apr. 8, 1974, Ser. No. 459,087

Int. Cl. F16c *33/64*

U.S. Cl. 308—235 23 Claims



1. A thrust bearing race comprising a radially extending annular raceway having inner and outer diameters; a flange integral with and projecting axially from the outer diameter of the raceway; and at least one lanced tab projecting from the free edge of the flange inwardly and axially toward the raceway.

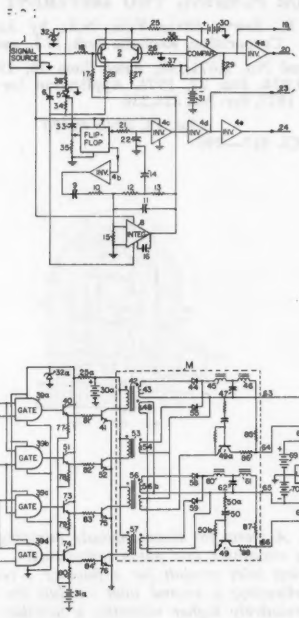
28,432
CLASS "D" LINEAR AUDIO AMPLIFIER

James A. Ross, La Jolla, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Original No. 3,579,132, dated May 18, 1971, Ser. No. 876,771, Nov. 14, 1969. Application for reissue Feb. 28, 1973, Ser. No. 336,853

Int. Cl. H03f *3/38*

U.S. Cl. 330—207 A 27 Claims



1. An electrical amplifier comprising;

a. comparator apparatus (1 to 24) having feedback to form a pulse-width modulated signal (19') from an amplitude-varying input signal (1') and a triangular wave amplitude-varying signal (8'),

b. first and second series of gating means (39a & c; 39b & d) connected to said comparator means, each said series supplied with a square wave signal (23' or 20') time related to said triangular wave signal to alternately pass said pulse-width modulated signal in successive halves of the duration of each pulse width,

c. a first type transformer (42, 56) having a primary and plural secondaries (43 & 48), said primary connected to one of said first series of said gating means (39a),

d. a second type transformer (53, 57) having a primary and one secondary (as 54), the primary of said second type transformer connected to one of said second series of said gating means (39b),

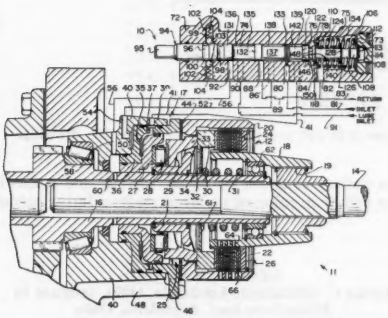
e. a plurality of low-pass filters (45, 46, 47; 60, 61, 62) equal in number to the number of said gating means in said first series, each said filter connected to secondaries of both a first and a second type transformer,

f. a power amplifier having at least two active elements (67 & 68) in opposed groups, and an output,
g. a connection (64) from one of said plurality of low-pass filters to one (67) of said active elements,
h. a connection (66) from another of said plurality of low-pass filters to a said active element (68) that is in the group opposed to said one active element,
i. a load (72), and
j. a connection from the output of said power amplifier to said load.

28,433
POWER TAKE-OFF CONTROL VALVE

Ronald J. Ronayne, Celina, Ohio, and Edwin Ketterling, Minneapolis, Minn.

Original No. 3,669,229, dated June 13, 1972, Ser. No. 9,489, Feb. 9, 1970. Application for reissue Apr. 24, 1974, Ser. No. 463,679
Int. Cl. F16d *67/02*
U.S. Cl. 192—12 C **20 Claims**



3. A control valve including a valve housing having a bore therein, a fluid inlet port for admitting pressurized fluid into said bore, first and second fluid outlet ports communicating with said bore, a valve spool in said bore movable in one axial direction from a neutral position where said inlet port is closed to a first position where said inlet port is in communication with said first outlet port, and in the opposite axial direction from said neutral position to a second position where said inlet port is in communication with said second outlet port, said bore having an enlarged portion which extends between first and second spaced apart stops, a portion of said spool being received in said enlarged bore portion, a biasing spring encircling said portion of said spool, and first and second spaced apart retaining means mounted on said portion of said spool for engaging opposite ends of said spring, said spring extending between said stops and biasing said retaining means against said stops when said spool is in said neutral position, so that, when said spool is moved in one axial direction to said first position said spring is compressed between said first stop and said first retaining means to bias said spool toward said neutral position [against fluid pressure acting on said spool], and when said spool is moved in the opposite axial direction to said second position said spring is compressed between said second stop and said second retaining means to bias said spool toward said neutral position [against fluid pressure acting on said spool], *a sleeve mechanism around said spool and in fluid communication with said inlet port when the valve is in said first position, a second spring around the spool and in operative engagement with the sleeve mechanism and the spool, said sleeve mechanism including a portion held out of engagement with the housing by fluid pressure when the valve is in the first position and the pressure is above a predetermined value, said sleeve portion being biased against the housing by the second spring when pressure drops below said predetermined value,* whereby, upon a drop in fluid pressure below a predetermined value said [spring] *springs* will automatically move said spool from said first position [or said second position] to said neutral position.

8. In combination with a power take-off unit adapted for use on a tractor and comprising:
(a) a power input member adapted to be driven by a prime mover;
(b) a power output member;
(c) an hydraulically actuated clutch mechanism situated between said input and output members and adapted to operatively connect said members when pressurized fluid is delivered to said clutch mechanism for operating same;
(d) an hydraulically actuated brake mechanism for holding said output shaft against rotation;
(e) a control valve for controling the flow of said pressurized fluid either to said clutch mechanism or to said brake mechanism;
(f) said control valve including a valve housing having a bore therein, a fluid inlet port for admitting said pressurized fluid into said bore, a first fluid outlet port communicating said bore with said clutch mechanism, a second fluid outlet port communicating said bore with said brake mechanism and a valve spool;
(g) the valve spool being movable in said bore between a first inlet-port-open position wherein said inlet port is in communication with said first outlet port for delivering said pressurized fluid to said clutch mechanism to actuate the same, a second inlet-port-open position wherein said inlet port is in communication with said second outlet port for delivering said pressurized fluid to said brake mechanism to actuate the same, and an inlet-port-closed position;
(h) biasing means for biasing said valve spool toward said inlet-port-closed position from said first inlet-port-open position; and,
(i) said biasing means being operable upon a drop in the pressure of said pressurized fluid below a predetermined value to move said valve spool from said first inlet-port-open position to said inlet-port-closed position whereby when the supply of hydraulic fluid is stopped, said valve spool is automatically moved to said inlet-port-closed position so that, after hydraulic pressure is again supplied, movement of said valve spool to said first inlet-port-open position is necessary to actuate said clutch mechanism for transmitting rotary power from said input to said output member.

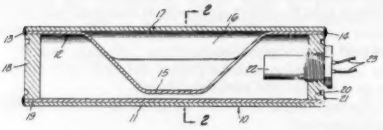
28,434
ACTUATOR

Charles R. Olsen, 112 Sherbrooke Ave., Hartford, Conn. 06106

Original No. 3,483,695, dated Dec. 16, 1969, Ser. No. 633,459, Apr. 25, 1967. Application for reissue Dec. 13, 1971, Ser. No. 207,015
Int. Cl. B67d *5/42;* **F01b** *29/08*
U.S. Cl. 60—632 **1 Claim**

3. An actuating device for pressurizing a working fluid in a fluid operated device comprising: an outer tubular member having a cylindrical tube wall defining a limited interior volume and capable of withstanding a high internal fluid pressure without substantial permanent deformation; an inner metallic, tubular member extending axially within the outer member and having a diameter at one end corresponding substantially to the inside diameter of the outer tubular member, the inner member also

having a deformable, collapsed, fluted wall portion defined by at least one longitudinally extending indentation along a section of the member, the wall portion being collapsed upon itself to substantially reduce the interior



volume in the collapsed section and to correspondingly form a substantial fluid receiving storage space in the limited interior volume of the outer tubular member between the outer tubular member and the collapsed wall portion, the inner tubular member also being closed and sealed at one longitudinal end to prevent rupture under high explosive pressurization; a non-rupturing, sealing plug mounted in the other end of the inner tubular member opposite the closed and sealed end to form a closed, non-rupturable and deformable fluid confinement vessel from the indented, sealed inner tubular member, and an explosive squib mounted from the sealing plug in the closed, fluid confinement space defined within the vessel and having squib actuating means exposed on the exterior of the sealing plug, the squib and sealing plug also being in sealing relationship to retain highly pressurized gases resulting from the explosion of the squib in the closed, fluid confinement space whereby the pressurized gases within the space may expand the longitudinally extending identation of the inner tubular member and displace the deformable, collapsed wall portion through the substantial fluid storage space to the outer tubular member to efficiently pressurize all the working fluid received in the storage space between the inner and outer members without allowing the pressurized gases to escape from the confinement space or mix with the working fluid pressurized.

PLANT PATENTS

GRANTED MAY 27, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,722
BLACK MAPLE TREE
William R. Heard, 5355 Merle Hay Road, Des Moines, Iowa 50323
Filed Apr. 16, 1974, Ser. No. 461,401
Int. Cl. A01h *5/12*
U.S. Cl. Plt—51 **1 Claim**

1. A new and distinct variety of black maple tree of the species botanically known as *Acer nigrum*, substantially as herein shown and described, characterized particularly as to novelty by its very upright, tall and substantially columnar form which terminates at its top in a rounded crown, its very straight trunk which is unusual for the species, with lateral branches which are both shorter and thicker than is normal for the species, by the mottled gray color of the bark of its trunk and which is warty and alligator-like in appearance, and by its dense and attractive foliage which ranges from dull green to rich dark green in color on its upper surface and yellow-green and softly downy, especially on the yellow veins, on its lower surface, said foliage becoming an attractive Indian yellow color on its upper surface and somewhat lighter yellow in color on its lower surface during autumn.

3,723
BEGONIA PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Feb. 28, 1974, Ser. No. 446,784
Int. Cl. A01h *5/00*
U.S. Cl. Plt—68 **1 Claim**

1. A new and distinct cultivar of *elatior* begonia characterized particularly by its sharper, more distinct orange flower color; dark spinach green leaves; vigorous growth habit; in propagation by leaf cuttings, a greater quantity of adventitious buds are produced on the base of the leaf petiole in a shorter period of time than on parent cultivar Krefeld Orange; distinctive natural placement of flowers on plant; excellent keeping qualities; 7–10 days faster flowering than parent, and by its year around flowering under controlled environment.

PATENTS

GRANTED MAY 27, 1975

ERRATA

For CLASS	See PATENT NO.
235-061.6 R	3,886,325
235-061.6 E	3,886,326
235-061.7	3,886,327
235-061.11 E	3,886,328
235-092.5 B	3,886,329
235-151.21	3,886,330
235-151.3	3,886,331
235-151.21	3,886,332
235-181	3,886,333
235-184	3,886,334
313-039	3,886,384
340-003 R	3,886,487
340-005 MP	3,886,488
340-005 MP	3,886,489
340-005 MP	3,886,490
340-009	3,886,491
340-015	3,886,492
340-015.5	3,886,493
340-015.5	3,886,494
340-018	3,886,495
340-041 R	3,886,496
357-054	3,886,569

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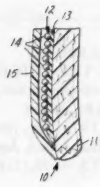
PATENTS

GRANTED MAY 27, 1975

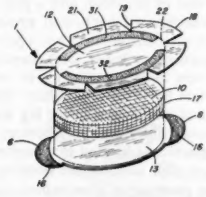
GENERAL AND MECHANICAL

3,885,246
RETROREFLECTIVE PROTECTIVE HELMET
Chi Fang Tung, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Nov. 5, 1973, Ser. No. 412,920
Int. Cl. A42b *3/02*; **G02b** *5/12*
U.S. Cl. 2—3 R **2 Claims**



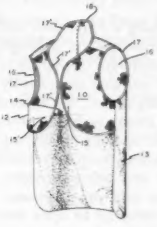
1. A protective helmet comprising a protective shell adapted to be worn on a person's head; a retroreflective layer disposed over substantially all of the outer surface of the protective shell, comprising a layer of binder material and a monolayer of transparent glass microspheres that are partially embedded in the layer of binder material and have a coating of specular reflective material on their embedded surfaces; and a transparent sheet having the shape of the protective shell disposed directly over the retroreflective layer, said sheet being in tight frictional engagement with said retroreflective layer but without optical contact to the exposed surfaces of the microspheres and being attached to the protective shell at least around the periphery of the retroreflective layer so as to provide an airtight sealed pocket between the retroreflective layer and the transparent sheet, whereby the retroreflective layer retroreflects light shined at the helmet under either wet or dry conditions.

3,885,247
SELF-ADHERING DISPOSABLE PROTECTOR
Rosemary J. Kost, 8231 Broadmoor, Mentor, Ohio 44060
Filed Sept. 12, 1974, Ser. No. 505,479
Int. Cl. A41d *27/12*
U.S. Cl. 2—55 **14 Claims**



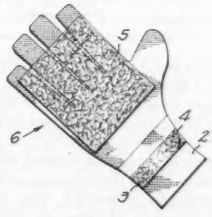
1. An absorbent protector comprising,
a flexible, resilient backing,
a pad attached to said backing for absorbing body fluid therein,
said backing including attachment portions projecting outwardly from opposite sides thereof and beyond said pad, adhesive means on said backing and said pad for securing said protector to a wearer's skin,
said adhesive means on said backing including an adhesive substance on said attachment portions spaced from said pad, and
said adhesive means on said pad including an adhesive substance extending along the peripheral edges thereof between said attachment portions for attaching said pad to the wearer's skin independent of said attachment portions such that said backing may shift relative to said pad in the applied position of said protector to accommodate movement of those portions of the wearer's body attached to said protector by said adhesive substance.

3,885,248
HUNTING VEST
Burton A. Salsby, 2428 S. Liberty Ave., Boise, Idaho 83705
Filed Mar. 7, 1974, Ser. No. 449,172
Int. Cl. A41d *1/00*
U.S. Cl. 2—94 **1 Claim**



1. A hunting vest having open-work foundation mesh which covers the upper torso from the neck to the waist having suitable armholes, said foundation mesh being fabricated of a suitable flexible polymeric mesh material; and a back panel of moisture-proof sheet material fastened to said foundation mesh extending from said collar to a point below the upper thigh and distally over the shoulders of said foundation mesh.

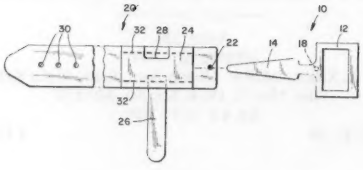
3,885,249
WORKING GLOVE
Jean L. De Brabander, Hamme, Belgium, assignor to Ferdinand Van Damme & Zonen, Hamme, Belgium
Filed Jan. 16, 1974, Ser. No. 433,784
Claims priority, application Belgium, Sept. 3, 1973, 804355
Int. Cl. A41d *19/00*
U.S. Cl. 2—161 R **5 Claims**



1. A work glove of which at least a surface portion of the palm side thereof comprises a burring fabric; and a working component comprising a sheet-like member, one side of which is provided with a cooperating burring fabric, said member being removably secured on the said surface portion of said glove by interengagement of their burring fabrics, the other side of the said member being outermost and being provided with abrasive means for performing an operation on a work-

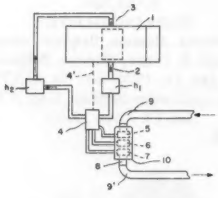
piece in response to relative movement between said member and workpiece.

3,885,250
RELEASABLE LOOP BELT
Barry Schiller, 911 Crestview, North Woodmere, N.Y. 11581
Filed Aug. 8, 1974, Ser. No. 495,881
Int. Cl. A41f *9/00*
U.S. Cl. 2—321 **8 Claims**



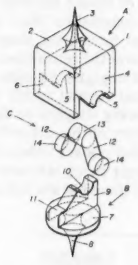
1. In a belt comprising a removable buckle having a strap receiving portion connected to a longitudinally extended appendage and provided with outwardly facing prong means, and a strap having at one end an inwardly facing sheath and prong receiving opening means, the appendage of said buckle being inserted in said sheath with said prong means projecting outwardly through said opening means, said end being further provided with an outwardly loop for retaining the other end of the strap, said other end being provided with at least one opening for receiving said prong means, the improvement wherein said loop is adapted to open readily upon outward pull on said other end of said strap.

3,885,251
ARTIFICIAL HEART PUMP OR ASSIST
Raul Ismael Pedroso, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.
Filed Mar. 5, 1973, Ser. No. 338,093
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **8 Claims**



1. An implantable heart pump for pumping and controlling the flow of blood through an artery which is severable to expose two adjacent ends to accommodate the pump therebetween, this pump being operable with first and second sources of high and low pressure fluid respectively, the pump comprising a tube securable between said severed ends of said artery to form a continuous blood flow passage, at least two sleeves each having a generally cylindrical bore at least partially surrounding and contacting said tube, the sleeves being axially spaced apart but adjacent to each other, a core element formed as a rod fixedly positioned generally centrally within the bore of said tube and adjacent the inner surface thereof, the tube having a bore diameter that is variable between large and small, each sleeve being responsive to a pressure change whereby its diameter is variable between large and small corresponding to said tube bore diameters, and valve means for communicating selectively said high and low pressure sources to said sleeves, whereby each sleeve periodically has a. a small diameter for constricting the tube to have a small bore diameter at the area of the tube adjacent said sleeve, and b. a large diameter permitting a corresponding large bore diameter of said tube with the tubes inner surface at that area being urged closely against said core to prevent blood flow in that area, the valve providing a predetermined sequence of constrictions and expansions of the sleeves and therefor of the tube to produce a pumping action in one direction on the blood flow therein, said apparatus further comprising an implantable Stirling engine including a heat source for operating the engine, the engine having a working space wherein working gas experiences a cyclic pressure variation between high and low, the apparatus further comprising duct means communicating said high and low pressure gas to said valve means.

3,885,252
DEVICE FOR UNITING THE THIGH AND LOWER LEG
Hirofumi Nakajima, 75 Koazanishigaito, Ooazakizu-cho Kizu-cho, Soraku-gun, Hyoto-fu, Japan
Filed Apr. 2, 1973, Ser. No. 346,900
Claims priority, application Japan, Apr. 7, 1972, 47-35618
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **1 Claim**

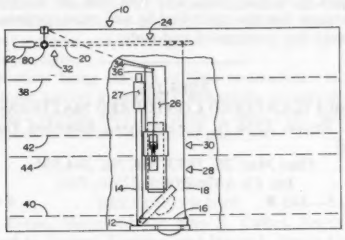


1. A device for uniting the thigh and the lower leg to one another comprising a frame element forming an upper joint member, said frame element including an upper face to be secured to the distal end of the thigh and a pair of opposite side walls, the undersurface of each wall provided with a recess having a semicircular surface to form a pair of laterally spaced pin bearing portions, a lower joint member disposed beneath said upper joint member, said lower joint member including a bottom plate having an underface which is to be secured to the proximal end of the lower leg and an upper element extending upwardly from said bottom plate, said upper element having a recess formed in its upper edge, said recess having a semicircular surface and forming a centrally positioned pin bearing portion, an intermediate joint member positioned between said upper joint member and said lower joint member, said intermediate joint member having a configuration in the form of a crank and including a pair of laterally spaced vertically disposed leg portions, an upper, horizontally disposed pin portion connecting the upper end of each leg portion to one another, a lower, horizontally disposed pin portion extending outwardly from the lower end of each of said leg portions, each of said lower pin portions being fitted in the respective formed pin bearing portions of said formed upper joint member, and the upper pin portion of said intermediate joint member being fitted in the centrally positioned pin bearing portion of said lower joint member, thereby enabling the thigh and lower leg to be united pivotally at two upper and two lower positions.

3,885,253
VARIABLE FLUSHING CONTROL UNIT ATTACHMENT FOR A TOILET

Charles A. Overbey, 16 Bougainvillea Dr., Cocoa Beach, Fla. 32931

Filed Feb. 12, 1974, Ser. No. 442,081
Int. Cl. E03d *1/34, 5/02, 5/10*
U.S. Cl. 4—67 A **3 Claims**



1. A water-saving attachment unit for a toilet having a water tank, an outlet valve to discharge water from said tank and a mechanism for operating said outlet valve to substantially empty the water from said tank, comprising:

A. a tubular element adapted to be located in said tank adjacent said outlet valve;

B. a buoyant energy cell slidably mounted in said tubular element and adapted to close said outlet valve;

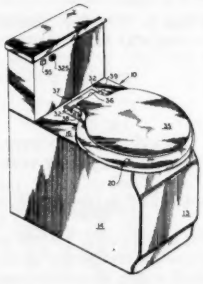
C. a retaining device mounted adjacent said tubular element to normally prevent said buoyant energy cell from sliding within said tubular element when said mechanism is operated to substantially empty the water from said tank; and

D. a control mechanism connected to said retaining device for selectively releasing said retaining device to permit said buoyant energy cell to slide within said tubular element and thereby prematurely close said outlet valve to effectuate only a partial emptying of the water from said tank.

3,885,254
INCINERATING COMMODE

James I. West, 7856 Feilder Road, Jonesboro, Ga. 30230

Continuation-in-part of Ser. No. 134,650, April 16, 1971. This application May 4, 1972, Ser. No. 250,232
Int. Cl. A47k *11/02*
U.S. Cl. 4—131 **15 Claims**



1. An incinerating commode for use in disposing of human waste comprising, in combination:

a. a commode body defining means permitting human waste to be introduced therein;

b. a combustion chamber operatively associated with said commode body, said combustion chamber including a liquid and solid waste confining combustion pot for receiving and confining said waste introduced into said commode body;

c. cylically operable heat source means operatively associated with said combustion chamber for incinerating waste contained therein, said heat source means detailed for developing an incinerating flame into and beneath said combustion pot;

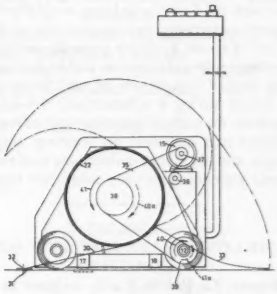
d. means operatively associated with said combustion pot for reducing the particle size of waste to be incinerated, said waste reducing means includes a pair of comminuting plates reciprocally supported within said combustion pot and reciprocally operable with respect to each other for effecting a reduction of the particle size of waste supported in said pot between said plates; and,

e. means for initiating a cycle of operation of said heat source means and said waste reducing means.

3,885,255
COVERING ARRANGEMENT FOR SWIMMING POOLS

Jörg L. Vorbach, Riedlingen, and Peter Tess, Ravensburg, both of Germany, assignors to Oberschwabishche Metallwarenfabrik GmbH & Co. KG, Riedlingen, Wurtt, Germany

Filed Apr. 25, 1974, Ser. No. 463,569
Claims priority, application Germany, Sept. 13, 1973, 2346139
Int. Cl. E04l *3/19*
U.S. Cl. 4—172.14 **21 Claims**



1. A covering arrangement for open areas comprising, in combination, flexible cover means; winding drum means attached to one end of said flexible cover means, said flexible cover means being windable on said drum means; reversible motor means linked to said drum means for unwinding said cover means from said drum means in one direction of said motor means, siad cover means being wound onto said drum means in the reverse direction of said motor means; wagon means for carrying said drum means and transporting said drum means; drive means on each side of said drum means; and coupling means connected between said motor means, drum means and drive means so that said motor means is connected to said drive means when said motor means rotates in said one direction, said motor means being connected through said coupling to said drum means when said motor means rotates in said reverse direction.

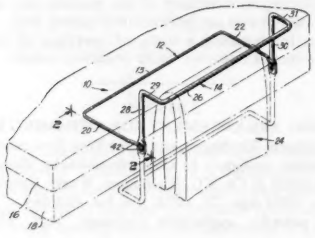
3,885,256
BEDSPREAD HOLDER OR THE LIKE

Philip L. Du Boff, Clifton, N.J., assignor to Shelfmaker Products Corporation, Kearny, N.J.

Filed June 14, 1973, Ser. No. 369,811
Int. Cl. A47c *21/00*
U.S. Cl. 5—319 **7 Claims**

1. A holder for holding a bedspread and the like adapted to be used with a mattress and box-spring comprising: first and

second U-shaped frame members each having a pair of legs pivotable connected to each other at the ends of said legs, and means comprising interfitting elements on each of the ends of said first and second frame members, for holding one of said frame members in a first position with respect to said other frame member, said first frame member when in use being adapted to be disposed at the end of a bed between said mattress and said box-spring, and said second frame member is free to pivot about the ends of said first frame member, the central portion of said second frame member connecting said pair of legs forming said U-shaped frame is offset by means of an angular bend in said second U-shaped frame member, said



central portion of said second frame member being adapted to store said bedspread of the like by the draping of same over said central portion without interfering with the end edge of said bed or with the feet of one lying on said bed; said interfitting elements comprising, recessed means in the form of a keyhole type of recess having a generally circular recess and an intercepting rectangular recess, and including an elongated slot in said pair of legs of one of said frame elements, and boss-like means having a substantially flat-sided projection protruding from the ends of said other pair of legs of said other frame element and including an aperture centrally passing therethrough; and pin means maintaining said ends of said legs of said frame elements pivotably connected together.

3,885,257

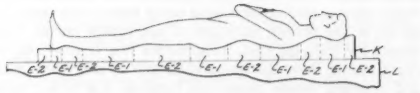
PRESSURE CONTROLLED RESILIENT SUPPORTING STRUCTURE

John E. Rogers, La Habra, Calif., assignor to Ronald J. P. Evans, Herts, England

Continuation-in-part of Ser. No. 301,724, Oct. 30, 1972, which is a continuation of Ser. No. 24,099, March 31, 1970. This application Apr. 20, 1973, Ser. No. 352,862

Int. Cl. A47c *27/08*

U.S. Cl. 5—345 R **4 Claims**



1. A resilient support for effecting full surface contact with the peaks and valleys of the portions of an irregularly shaped object resting thereon to substantially equalize the pressure distribution of said object over the surface of said support in contact with said object, said support comprising:

a. a block resilient material that has a plurality of spaced grooves extending inwardly from a first side thereon on which said object rests, which grooves cooperatively define a plurality of independently movable pads therebetween, with each of said pads having flat external first surfaces of substantially of said pads having flat external first surfaces of substantially the same area that lie in a common plane when said object is not supported on said block, with a first portion of each of said pads compressing inwardly in proportion to the transverse cross-sectional area of said pad inwardly from said first surfaces and the loading to which said pad is subjected, with first groups of said pads that are subjected to the load of said peaks of said object being of greater transverse cross-sectional area than second groups of said pads that are subjected to the valleys of said object, and with the ratio of said transverse cross-sectional areas of said first and second groups of said pads being so chosen that when said object rests on said block said peaks and valleys of said object in contact with said first side are subjected to pressures that are controlled by said cross-sectional areas of said first portions of said pads.

3,885,258

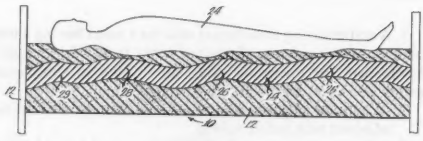
MULTI-LAYERED CONTOURED MATTRESS

John J. Regan, 2316 N. Harlem Ave., Elmwood Park, Ill. 60635

Filed Mar. 26, 1973, Ser. No. 344,594

Int. Cl. A47c *23/00, 27/00, 7/02*

U.S. Cl. 5—345 R **6 Claims**



1. A mattress body support, comprising: a bottom resilient layer having a contoured upper surface;

an intermediate layer having a greater firmness than said first layer and being of lesser thickness, said intermediate layer having upper and lower contoured surfaces corresponding to contour of the first layer, said upper and lower contours undulating upwardly at the user's head, shoulders, buttocks and calves; and

a top layer having greater resilience than said intermediate layer and having a substantially flat upper surface and a lower surface having a contour corresponding to the contour of the upper surface of the intermediate layer, all of said contoured surfaces having a wave-like shape that is a physical inversion of the shape of a human body, for supporting a human body over its entire length on the upper surface of the top layer in a level condition.

3,885,259

CUSHION WITH HEAT CONDUCTIVE BUTTONS

Kim ykow 8cheong, 7537 0dunbarton 0ave., ylos 0angeles, 8calif. 90045

Filed Sept. 6, 1974, Ser. No. 503,606

Int. Cl.² A47C *23/00*

U.S. Cl. 5—347 **13 Claims**

1. A cushion comprising:

a sheet of flexible material;

cushioning material at an inner side of said flexible sheet acting to cushion the deformation thereof; and

a large number of buttons carried at the outer side of said sheet of material and projecting outwardly therebeyond and having outer surfaces facing in a direction essentially away from said sheet and exposed for supporting contact with a person resting thereagainst or his clothing;

adjacent ones of said buttons having side surfaces which are spaced laterally apart in a relation defining air circulation passages between said side surfaces of adjacent buttons and inwardly of said outer surfaces of the buttons;

said flexible sheet having portions laterally between adjacent buttons spaced inwardly beyond the level of said outer surfaces and defining inner sides of said air circulation passages;

said buttons being formed of rigid nonmetallic, inorganic material having a thermal conductivity greater than that of said flexible sheet to conduct heat from said outer surfaces to said air circulation passages.

3,885,260

BEEHIVE FRAME

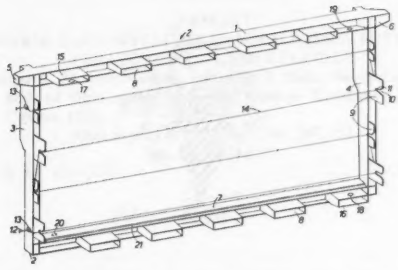
Neil C. Byrne, Mount Colah; John R. Cullen, North Ryde; Richard G. Parker, Camden, and Harry L. Davis, Camden, all of N.S.W., Australia, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,515

Claims priority, application Australia, Nov. 24, 1972, 1356/72

Int. Cl. A01k *47/02*

U.S. Cl. 6—2 R **10 Claims**



1. A beehive frame comprising two similar rectangular half-sections adapted to be secured together in a common plane of said half-sections, each said half-section comprising elongate top, bottom and wall sides, a plurality of spaced lugs extending from said top and bottom sides and through said plane, a plurality of protrusions extending from said wall sides through said plane, said protrusions being laminaly formed, each of said protrusions having a slot formed therein extending to said plane, and means to detachably secure the two sub-frames together along said plane.

3,885,261

PIPE CUTTING TOOL

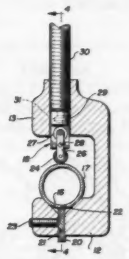
John Skvarenina, 2639 W. Augusta, Chicago, Ill. 60622

Filed Apr. 24, 1974, Ser. No. 463,543

Int. Cl. B25f *1/04;* **B23b** *5/16;* **B26d** *3/16*

U.S. Cl. 7—14.1 R **6 Claims**

1. A pipe cutting tool for cutting round tubular pipe comprising: a support frame having first and second spaced apart frame members, pipe receptacle means formed in said first frame member, an adjustable member secured to said second frame member for movement toward and away from said pipe receptacle means, cutter means secured to said adjustable member for engaging the outer surface of the pipe or tubing positioned at said pipe receptacle means for cutting thereof when said support frame is rotated about the pipe or tubing and said cutter means is in contact with the outer surface thereof, abrasive means secured to said support frame to be in contact with the outer periphery of the pipe or tube for cleaning the portion of the pipe or tube immediately adjacent the



cut made therethrough by said cutting means, and means for removing said cutter means from engagement with the pipe or tubing while maintaining said abrasive means in contact with the pipe or tubing.

3,885,262

METHOD FOR THE CONTINUOUS DECATIZING OF FABRICS

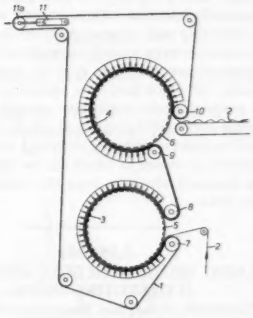
Dieter Riedel, Hausberge/Porta, Germany, assignor to Drabert Sohne, Minden, Westphalia, Germany

Filed Mar. 19, 1973, Ser. No. 342,549

Claims priority, application Germany, Mar. 20, 1972, 2213429

Int. Cl. D06c *1/08*

U.S. Cl. 8—149.3 **5 Claims**



1. A method of continuously decatizing a fabric web comprising the steps of

applying steam at a steam-applying station to the fabric web as the web traverses a cylindrical path and is subjected to pressure generated by tension applied to a length of backing cloth, and

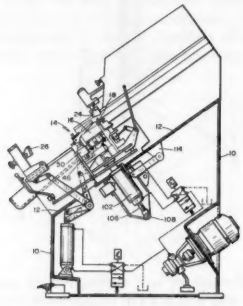
applying suction at a suction-applying station to the fabric web as the web traverses a cylindrical path and is subjected to pressure generated by tension applied to a length of backing cloth,

the pressures in the lengths of the backing cloth at the steam-applying station and at the suction-applying station being variable independently of one another.

3,885,263
SHOE SUPPORT FOR LASTING MACHINE

Victor J. Gagnon, Salem, Mass., assignor to American Shoe Machinery Corp., Woburn, Mass.

Filed Dec. 14, 1973, Ser. No. 424,658
Int. Cl. A43d 21/00
U.S. Cl. 12—142 R 14 Claims



1. In a machine for pulling over and lasting a welt shoe assembly which includes a last, an insole at the bottom of the last, and an upper draped about the last, the insole having a rib secured to the bottom thereof and extending downwardly therefrom in generally horseshoe-shaped configuration, said machine having a plurality of shoe operating instrumentalities disposed about a shoe operating station, said instrumentalities including pincer jaws for gripping and pulling the upper over said last, an improved shoe support comprising:

a suppport member mounted at said shoe operating station and having a generally horseshoe-shaped periphery, said member having a heelward end and a toeward end, the bight of said horseshoe-shaped periphery being disposed at the toeward end of said member;

said pincer jaws being mounted in said machine to generally surround said periphery of said support member in a substantially horseshoe-shaped array; and

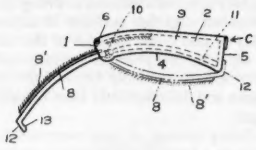
means mounting said support member in said machine for movement between a working position in which said shoe assembly disposed on said support member is located at a position in which said shoe operating instrumentalities may perform their respective operations on said shoe assembly and an idle position in which at least the toe end of said support member is disposed above said working position to an extent in which the toe region of said insole rib is disposed above at least the most toeward of said pincer jaws.

3,885,264
CLEANING BRUSH WITH DUST REMOVING AND COLLECTING MEANS

Teruya Tsuruzawa, Suita, and Muneyuki Ueda, Nishinomiya, both of Japan, assignors to Nippon Seal Co., Ltd., Osaka, Japan

Filed Sept. 7, 1973, Ser. No. 395,000
Claims priority, application Japan, Sept. 9, 1972, 47-90719
Int. Cl. A46b 9/02, 17/04, 17/06
U.S. Cl. 15—185 4 Claims

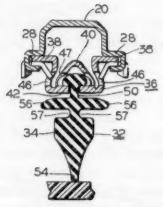
1. A cleaning brush device comprising: a relatively flat casing having an opening at one end and an upper cover plate; a first brush member formed on the face of said upper cover plate within said casing; a second brush member adapted to be inserted into and pulled out of the casing through said opening; short bristles closely implanted on one surface of the first brush member to form a dust removing surface; short bristles closely implanted on one surface of the second brush member to form a cleaning brush surface, the bristles on the first brush member being inclined in a direction away from said opening, the bristles on the second brush member being inclined in the same direction as the bristles on the first brush member, the bristles of said first brush member and the second brush member being engageable with each other as the second brush member is inserted into or pulled out of the casing; and means for holding the pulled-out second brush member on the casing so that the cleaning brush surface thereon is exposed so as to be engageable with an article to be cleaned by brushing.



3,885,265
WINDSHIELD WIPER BLADE ASSEMBLY

Raymond A. Deibel, West Falls, and William F. Kuebler, East Aurora, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,506
Int. Cl. B60s 1/04, 1/38
U.S. Cl. 15—250.42 9 Claims



7. A refill unit for a wiper blade assembly comprising an elongate squeegee element of elastomeric material and an integrally formed backing strip of plastic material for supporting said squeegee element and means for retaining said squeegee element in assembled relationship with said backing strip; said backing strip comprising a pair of spaced apart elongate side rails, a channel-shaped body member having its open side remote from said side rails and a flexible leg depending downwardly from each of said side rails connecting said side rails to said channel-shaped body member, said squeegee element comprising a wiping lip portion, an anchoring bead and a neck portion of narrower transverse width than the wiping lip portion and the anchoring bead and connecting them together, said body portion including a pair of opposed edges to retain the anchoring bead within the channel-shaped body portion.

3,885,266
CLOSEABLE, DISPOSABLE PAPERBOARD SCOOP

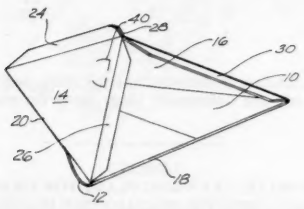
Betty O. Nafziger, 157 Congress Run Rd., Cincinnati, Ohio 45215

Filed Sept. 1, 1972, Ser. No. 285,679
Int. Cl. A01k 29/00; A47l 13/52
U.S. Cl. 15—257.1 7 Claims

1. A closeable, disposable, collapsible scoop structure formed from a one-piece paperboard blank, said structure comprising:

a. a triangular base panel having at least two equal sides,

b. congruent triangle panels hingedly connected to the equal sides of said base panel,
c. a third triangular pannel hingedly connected to the remaining side of said base panel,
d. a straight fold line running across said base panel from the apex thereof to the apex of said third triangular panel,
e. a pair of mating handle panels hingedly connected to the free edges of said congruent triangular panels which extend outwardly from said apex of said base panel,



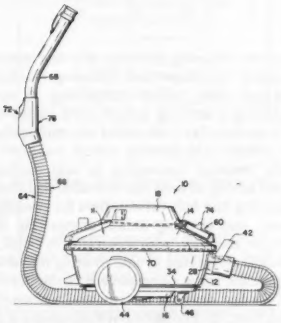
f. said congruent triangular panels being folded relative to said base panel with said mating handle panels juxtaposed and secured together to define a triangular scoop having an open mouth, said third panel being foldable relative to said base panel to close the mouth of said scoop, and
g. means for detachably securing a free edge of said third triangular panel to the adjoining congruent triangular panel to maintain said third panel in the closed position.

3,885,267

FLOOR CARE APPLIANCE HANDLE WITH A BUTTON-PERATED PISTON AND CYLINDER

Edgar A. Maurer, Canton, and Arne J. Diehl, North Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Sept. 13, 1973, Ser. No. 397,152
Int. Cl. A47l *9/00*
U.S. Cl. 15—339 **6 Claims**



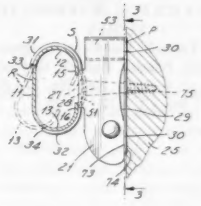
1. A handle arrangement for use with a floor care appliance including;
a. a hose extending from said floor care appliance,
b. a first handle part capturing the remote end of the hose,
c. a tubular member provided for the easy attachment of cleaning tools,
d. a second handle part capturing the end of said tubular member,
e. said first and second handle parts being telescoped together to provide an assemblage for easy operator manual manipulation,
f. said assemblage receiving nestingly therein a piston and cylinder means for providing a pressure pulse for said floor care appliance,
g. a button, integral with one of said piston and cylinder means, extending from said assemblage for easy manual manipulation, and
h. conduit means connected to said cylinder and piston means and extending within at least a part of said assemblage for conveying said pressure pulses generated by said piston and cylinder means towards a location outwardly of said assemblage.

3,885,268

MOUNTING DEVICE FOR WINDOW DRAPERIES

William E. Stieler, 6832 Marlette Rd., and Scott M. Stieler, 6048 Marlette Rd., both of Marlette, Mich. 48453

Filed Mar. 15, 1974, Ser. No. 451,441
Int. Cl. A47h *1/04*
U.S. Cl. 16—94 D **17 Claims**



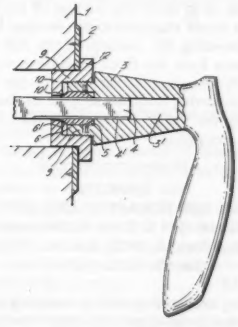
1. A hardware system for hanging draperies on a wall including a rod for supporting the draperies to permit traverse thereon, brackets at each end of said rod, and means for attaching said brackets to said wall each bracket comprising a body surface parallel to said wall, a pair of clips extending outwardly from said body surface for retaining said rod against said body surface, legs projecting inwardly from said body surface for contacting said wall and spacing said rod from said wall a minimum distance to permit traverse of the draperies, said pair of clips being curved to wrap around the upper and lower portion of said rod to permit said rod to be engaged and disengaged by a snap action requiring a twisting movement.

3,885,269

DOOR HANDLE

Arvid Frimann Helland, Prof. Kohts vei 60, Stabekk, Oslo, Norway

Filed Jan. 28, 1974, Ser. No. 436,980
Claims priority, application Norway, Jan. 26, 1973, 350/73
Int. Cl. A47b *95/02*
U.S. Cl. 16—110 R **3 Claims**



1. In a door handle of the kind comprising a square bolt extending through the lock and the door and on at least one of whose protruding ends is fastened a sleeve-like inner sec-

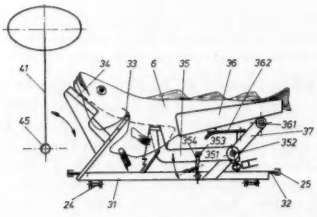
tion of the stem of the door handle, and wherein the inner end of said sleeve-like section is threaded on the outside for engagement with a locking sleeve screwed onto said inner section, the inner section of the locking sleeve having an inwardly directed flange and the outer section having a head suitable for engagement with a tool for turning of the locking sleeve, the improvement wherein the bore of the sleeve-like inner section in its inner end has an enlarged section in which is located an annular element whose inner end surface is chamfered for cooperation with said flange of the locking sleeve such that the inner edge of the flange will be forced against the sloping end surface of the annular element and clamp the element into locking friction engagement with the square bolt when the locking sleeve is tightened on the inner end of said sleeve-like section.

3,885,270

METHOD AND DEVICE FOR SEVERING THE HEADS OF FISHES

Franz Dohrendorf, Lubeck, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Apr. 6, 1972, Ser. No. 241,512
Int. Cl. A22c *25/18*
U.S. Cl. 17—52 **4 Claims**



1. A method of processing the head of gutted fish in which the gill cavity and abdominal cavity have been opened, comprising the steps of:

mounting a gutted fish belly-side-down on a support with the gill cavity spread apart and straddling an upstanding support member which holds the head between the arc of the lower jaw in a fixed position in alignment with the longitudinal direction of the fish body,

severing the fish body from the fixed head by a first wedge-shaped cut behind the collar bones, which cut extends into the gill cavity and is directed inwardly and rearwardly from the opposite sides of the fish toward the center thereof, with the angle of the wedge-shaped cut being such as to leave the portion of the fish containing the collar bones attached to the severed head,

thereafter severing the portion of the fish containing the collar bones from the fixed head by a second cut transverse to the longitudinal direction of the fish,

and finally removing from the support the head, the portion containing the collar bones, and fish body for further separate processing.

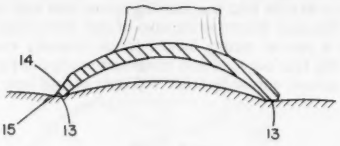
3,885,271

TOOL FOR SCRAPING AND CUTTING

Alfred A. Kollander, 314 S. Third St., Stillwater, Minn. 55082

Filed July 18, 1973, Ser. No. 380,483
Int. Cl. A22b *5/10, 5/16*
U.S. Cl. 17—69 **3 Claims**

1. A scraping and cutting tool, comprising in combination: a spoon-like device having an inverted bowl section and an upwardly angulated attached handle made out of substantially stiff inflexible material; the periphery of the bowl portion containing undulations constituting scraping teeth having sharp edges separated from each other by distinctly blunt edges; the underside of the periphery of the bowl portion being flat for providing a guiding surface for scraping; and approximately one-half of the peripheral edge of said bowl



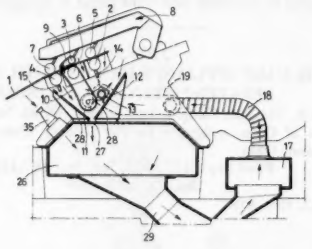
portion including a distinctly sharp cutting edge which is continuously and uniformally sharp along the entire length thereof.

3,885,272

PNEUMATIC CLEANING PLANT FOR DRAWING SYSTEMS IN SPINNING PREPARATION MACHINES AND SPINNING MACHINES

Angelo Marzoli, Bergamo, Italy, assignor to Folli Marzoli & C.S.P.A., Italy

Filed Aug. 2, 1973, Ser. No. 384,974
Claims priority, application Italy, Aug. 10, 1972, 28081/72
Int. Cl. D01h *5/66*
U.S. Cl. 19—245 **3 Claims**



1. A pneumatic cleaning plant for drawing systems in spinning preparation machines and spinning machines having drawing and belt drive rollers comprising, in combination, means for placing a drawing system zone under suction and comprising: a suction fan with outlet communicating with the atmosphere outside said drawing system zone, and a funnel-shaped intake member connected to said suction fan; and blowing means having at least one movable member separated from said drawing and belt drive rollers for feeding jets of air into said zone, said blowing means comprising at least one rotating movable member, with a plurality of holes, and motor driven fan means connected to said rotating movable member; said blowing means being a component of the drawing system; a lower belt for the drawing system; and a tensioning device for said lower belt, said component comprising a support bar for said tensioning device.

3,885,273

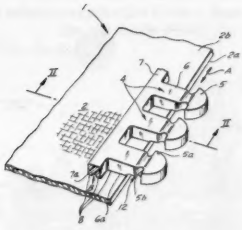
SLIDE FASTENER

Helmut Heimberger, Grenzach, Germany, assignor to Opti-Holding AG, Glarus, Switzerland

No Drawing. Filed Jan. 25, 1974, Ser. No. 436,630
Claims priority, application Germany, Jan. 26, 1973, 2303797
Int. Cl. A44b *19/14*
U.S. Cl. 24—205.13 D **8 Claims**

1. A slide fastener stringer half comprising a textile support tape and a coupling element along an edge of said tape, said coupling element comprising a multiplicity of spaced coupling

members each having a coupling head adapted to interdigitate with the coupling heads of a similar coupling element on a mating stringer half, and at least one fastening portion unitarily with said head and secured to said tape, said coupling



element being further provided with a connecting portion between each coupling member and adjoining coupling members, at least one of said portions being provided with an annular planar surface confronting said tape and formed with a multiplicity of humps in a surface array welded to said tape.

3,885,274

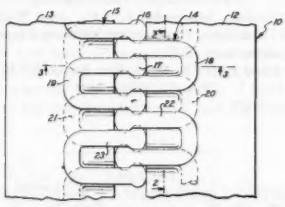
THREADLESS SLIDE FASTENER CHAINS

George B. Moertel, R.D. #3, Conneautville, Pa. 16406

Continuation-in-part of Ser. No. 64,487, Aug. 17, 1970, abandoned. This application Feb. 10, 1972, Ser. No. 225,146

Int. Cl. A44b *19/10*

U.S. Cl. 24—205.16 C **18 Claims**



1. In a threadless slide fastener chain, the combination comprising

a carrier tape,

a filamentary stringer having a plurality of head elements and a plurality of generally U-shaped heel members with leg portions interconnecting the plurality of head elements,

said filamentary stringer being disposed along a longitudinal edge of said carrier tape with a first set of the plurality of heel members on one side of the carrier tape and with a second set of the plurality of heel members on the other side of the carrier tape,

said filamentary stringer having first interstices between the leg portions of the first set of heel members and having second interstices between the leg portions of the second set of heel members,

said carrier tape adjacent the longitudinal edge being sinuous to form portions of the carrier tape projecting into the first interstices, and

said first and second sets of heel members being threadlessly bonded with said carrier tape such that the projecting portions of the carrier tape are retained in the first interstices.

3,885,275

STRINGER STRUCTURE FOR SLIDE FASTENERS

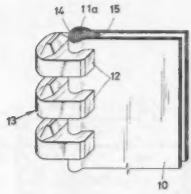
Akira Hasegawa, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1974, Ser. No. 454,324

Claims priority, application Japan, Apr. 4, 1973, 48-40634; Apr. 4, 1973, 48-40635

Int. Cl. A44b *19/04*

U.S. Cl. 24—205.16 R **4 Claims**



1. A stringer for a slide fastener comprising a tape of non-woven textile material folded about its central longitudinal axis, an elongated, flexible core enclosed within the folded edge portion of said tape, and a row of fastener elements anchored to the folded edge portion of said tape said fastener elements each having a pair of securing arms compressively embracing said edge portion of the tape, said core being retained within said edge portion exclusively by forces exerted thereon by the securing arms of the fastener elements, said core having an integral longitudinal ridge narrower than said core and extending throughout its length and at least to the ends of said securing arms.

3,885,276

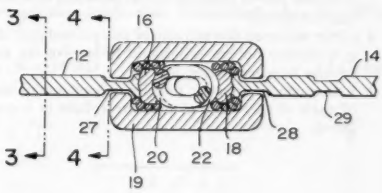
SLIDE FASTENER AND METHOD AND APPARATUS FOR MAKING THE SAME

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Sept. 18, 1972, Ser. No. 289,852

Int. Cl. A44b *19/02*

U.S. Cl. 24—205.16 R **10 Claims**



1. In a slide fastener, the combination comprising

a pair of carrier tapes,

each tape having a textile matrix of interlaced warp and weft threads of generally circular configurations,

an edge portion on each carrier tape,

said edge portions being oppositely disposed to each other, interlocking elements on each edge portion,

the interlocking elements on one edge portion adapted to be engaged and disengaged with the interlocking elements on the other edge portion,

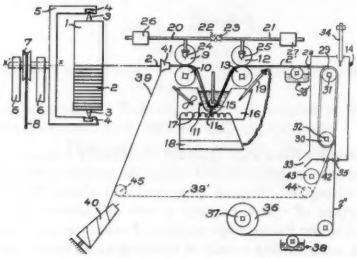
compacted portions on said carrier tapes forming channelized sections extending longitudinally with and spaced from said edge portion, and

the warp and weft threads, which define the textile matrix of said channelized sections, having non-circular configurations.

3,885,277
APPARATUS FOR SIZING TEXTILE FIBRES

Richard Adrien Schutz, 22, rue George Sand, and Pierre Elisée Exbrayat, 11, rue Jean Montavont, both of 68 Mulhouse 02, France

Division of Ser. No. 203,720, Dec. 1, 1971, Pat. No. 3,791,132. This application Oct. 1, 1973, Ser. No. 402,031
Int. Cl. D02j *13/00*
U.S. Cl. 28—1 R **11 Claims**



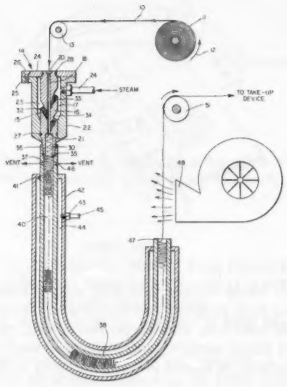
1. Apparatus for forming sized slivers or rovings, said apparatus comprising, in combination:
a. a frame;
b. a feed bobbin for slivers or rovings mounted for free rotation substantially without friction in said frame;
c. a vat of size;
d. a first pair of pressure rollers mounted between said feed bobbin and said vat;
e. a second pair of pressure rollers mounted downstream of said vat of size;
f. a drier mounted downstream of said second pair of rollers;
g. a windup bobbin positioned to receive the slivers or rovings from said drier; and
h. a drive means effective to drive at least one of the rollers of each of said pairs of pressure rollers at a controlled speed.

3,885,278
APPARATUS FOR TEXTURING YARN

Ralph Whitaker, Bala Cynwyd, Pa., assignor to Fred Whitaker Company, Bala Cynwyd, Pa.

Filed May 11, 1973, Ser. No. 359,611
Int. Cl. D02g *1/20*
U.S. Cl. 28—1.3 **22 Claims**

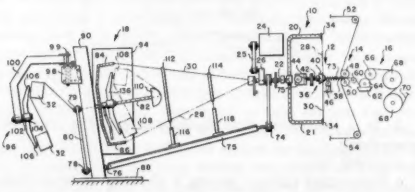
1. Apparatus for facilitating the texturing of yarn delivered thereto, comprising an elongated, enclosed yarn guide member having a yarn passageway extending therethrough between an inlet and an outlet thereof, said passageway extending to a yarn crimping chamber arranged to receive yarn from said passageway, for accommodating and crimping a wad of yarn therein, said crimping chamber having a yarn wad outlet end opening in a downstream direction relative to the travel of yarn, resistance means offering resistance to the movement of crimped yarn from said crimping chamber, and impelling means comprising a plurality of opposed and substantially parallel spaced passages angled to provide a force component in the direction of movement of the yarn and arranged at a plurality of longitudinally spaced locations along said passageway.



3,885,279
YARN FEED GUIDE ARMS

Nolan B. Darnell, Spartanburg, S.C., and Walter Engels, Tryon, N.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed June 18, 1973, Ser. No. 370,836
Int. Cl. D04h *3/05*
U.S. Cl. 28—1 CL **1 Claim**

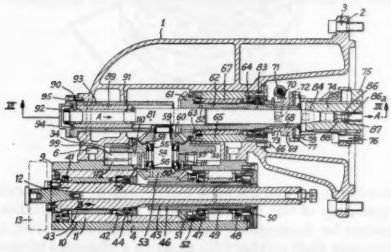


1. Apparatus for producing non-woven fabric comprising: yarn guide means including a first pair of yarn guides spaced from each other, means for supporting a plurality of yarn packages, rotable yarn guide means operably associated with said first pair of yarn guides to supply yarn simultaneously from each of said yarn package supports and to wind the yarn about said first pair of yarn guides to form reaches therebetween, said rotable yarn guide means including a radially directed yarn guide member, a portion of said yarn guide member being bent toward the axis of said first yarn guides means for combining a sheet of yarns with the yarn reaches between said first pair of spaced yarn guides to form a non-woven fabric, means to rotate said rotable yarn guide means in one direction and a portion of said radially directed yarn guide member is bent in a direction opposite to said direction of rotation of said rotable yarn guide means.

3,885,280
BI-ROTATIONAL HEADS MOUNTED ON MILLING AND BORING MACHINES

Charles William Berthiez, 5, Avenue Eglantine, Lausanne, France

Filed Dec. 26, 1972, Ser. No. 318,635
Claims priority, application France, June 1, 1972, 72.00377
Int. Cl. B23b *39/02, 39/14*
U.S. Cl. 29—26 R 10 Claims

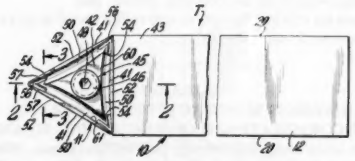


1. A bi-rotational head for milling and boring machines having a rotary spindle and a sliding member comprising
- a body mounted on said machine capable of pivoting with respect to the rotary spindle of said milling and boring machine;
- a casing pivotally mounted on an axis disposed at an angle to said rotary spindle for rotation on said body;
- a slider positioned within said casing and connected by a first kinematic chain through said casing and said body to the sliding member of said milling and boring machine for axial translation; and
- a tool-carrying spindle rotatably mounted in said slider and connected by a second kinematic chain through said casing and said body to the rotary spindle of said machine whereby said tool-carrying spindle is capable of rotation whatever the angular position of said tool-carrying spindle and whereby said slider is capable of axial translation whatever the angular position of said tool-carrying spindle.

3,885,281
CUTTING INSERT WITH CHIP CONTROL

Abraham M. Stambler, Haifa, Israel, assignor to Iscar Ltd., Nahariya, Israel

Filed June 10, 1974, Ser. No. 478,031
Int. Cl. B26d *1/00*
U.S. Cl. 29—95 R 8 Claims

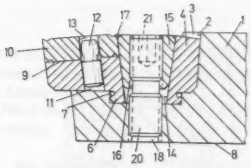


1. A cutting insert comprising a polygonal shaped piece of material for machine cutting of steel, having straight side edges meeting at the corners of said piece, said piece having a surface formed with longitudinal channels alongside said side edges, said channels merging at the corners of said piece, and said piece being formed with V-shaped grooves depressed into said channels at the corners of said piece, each V-shaped groove having legs aligned with two adjoining ends of adjacent channels, respectively, said legs merging at the apeces of said piece.

3,885,282
MACHINING TOOL

Josef Pataky, Nordliche Lohstrasse 19, D-4150 Krefeld, Germany

Filed Oct. 23, 1973, Ser. No. 408,734
Int. Cl. B26d *1/00*
U.S. Cl. 29—98 8 Claims

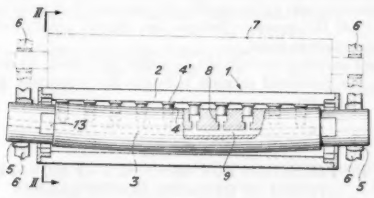


1. A machining tool, comprising a holder and an insert having a bearing surface for a tool member, said insert being adapted to be axially rotatably mounted in a recess formed in the holder and to be clamped in a desired position in the holder by means of a set screw, said insert being provided with an outwardly flared recess adjacent to said bearing surface and with a tapered clamping member adapted to fit in said flared recess to be fixed by said set screw whereby the clamping member can engage directly against one side of the tool member to be clamped and the tool member and the insert can be clamped simultaneously to the holder, said machining tool having two abutments provided to support the tool to be clamped, one of the abutments being formed by a peg or the like engaging in an aperture in the tool member and the other abutment being formed by a fixed bearing surface on the insert adjacent said tapered recess so that the region of application of the clamping member against the tool member and the fixed bearing surface face the same side of the tool member to be clamped and the peg or the like forms a point of leverage.

3,885,283
PRESS ROLL

Mario Biondetti, Schio, Italy, assignor to Escher Wyss Aktiengesellschaft, Zurich, Switzerland

Filed Oct. 25, 1973, Ser. No. 409,644
Claims priority, application Switzerland, Oct. 26, 1972, 15679
Int. Cl. B21b *13/02*
U.S. Cl. 29—116 AD 12 Claims

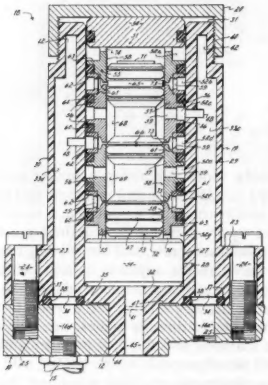


1. A press roll comprising:
- a fixed axial beam;
- a rotatable roll shell disposed about said beam to move in a free manner in a radial direction relative to said beam; and
- a plurality of hydrostatic supporting elements guidably mounted in said beam in a predetermined supporting plane to rotatably support said shell on said beam and to follow movements of said shell, said supporting elements constituting the sole means to restrict motion of said shell with respect to said beam in said plane.

3,885,284
METHOD OF MANUFACTURING VALVES

William L. Clippard, III, Cincinnati, Ohio, assignor to Clippard Instrument Laboratory, Inc., Cincinnati, Ohio

Division of Ser. No. 206,636, Dec. 10, 1971, Pat. No. 3,766,935. This application Apr. 5, 1973, Ser. No. 348,302
Int. Cl. B23p *15/00*
U.S. Cl. 29—157.1 R 5 Claims



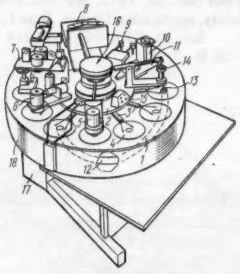
1. The method of manufacturing a valve comprising:
forming a manifold having a valve cavity,
forming a plurality of longitudinal fluid passages in said manifold around said cavity, said passages extending parallel to said cavity from an end of said manifold but spaced radially outwardly from said cavity,
forming a valve mechanism having a sleeve dimensioned to be slidably inserted into said cavity, said sleeve presenting axially spaced peripheral grooves around it,
porting the manifold to form ports between particular passages and said cavity, said porting being carried out in a single operation by removing material from said manifold only in an area between the respective passage and the cavity, by moving a port forming tool along a generally radial path connecting said cavity and the respective longitudinal passage,
the axial position of each said port corresponding to the axial position of a different one of the grooves around said sleeve,
inserting said sleeve axially into said cavity to such position that the grooves thereon are aligned axially with the respective ports,
and securing the said sleeve within said cavity to maintain the positional relation between the respective grooves and ports.

3,885,285
INSTALLATION FOR ASSEMBLY OF MOVABLE SYSTEM OF DYNAMIC LOUDSPEAKERS

German Borisovich Panteleev, prospekt Metallistov, 82, kv. 158, Leningrad, U.S.S.R.

Filed Sept. 27, 1973, Ser. No. 401,555
Int. Cl. H05k *13/00*; B23p *19/04*
U.S. Cl. 29—203 D 7 Claims

1. An installation for assembly of the movable system of dynamic loudspeakers, comprising, in combination: a base carrying diffusers of loudspeakers; a drive for moving said base; a device for securing the diffusers of the loudspeakers to said base; a device for winding wire onto a reel of a sound coil of a loudspeaker; a device for drying the sound coil of the loudspeaker; a device for affixing one of the diffusers of the loudspeakers to the reel of the sound coil; a device for gluing the reel and winding of the sound coil; technological mandrels, each of which is a gauge for the reel and accompanies a diffuser of a loudspeaker from the moment the reel of the

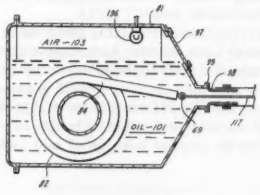


loudspeaker is fed into the neck thereof and to the moment of final assembly of the movable system of the loudspeaker; a mechanism for transporting said technological mandrels; and a distribution shaft arranged for ensuring a sequence of operations performed by said devices and mechanism.

3,885,286
STREAMER MANUFACTURE

A. C. Hill, Houston, Tex., assignor to Teledyne Exploration Company, Houston, Tex.

Filed Nov. 23, 1973, Ser. No. 418,659
Int. Cl. H01r
U.S. Cl. 29—203 D 11 Claims



1. Apparatus for assembling a seismic streamer comprising a pressure vessel containing a rotatably mounted reel adapted to have a seismic streamer harness wound thereon,
said vessel being adapted to contain oil, adapted for filling a seismic streamer sheath, and pressurized air over the oil,
said vessel having an outlet adapted to be connected to said sheath for a seismic streamer and through which a harness wound on the reel can extend, and
means for driving the reel at controlled speed to pay out the harness to such sheath.

3,885,287
HARNESS MANUFACTURING APPARATUS INCORPORATING HARNESS TESTING MEANS

Robert Alvin Long, Harrisburg; Joel William Lucas, Dillsburg; William Roderick Over, Harrisburg, all of Pa., and Donald Sudson Doty, Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 8, 1974, Ser. No. 459,155
Int. Cl. H01r *43/00*
U.S. Cl. 29—203 MW 18 Claims

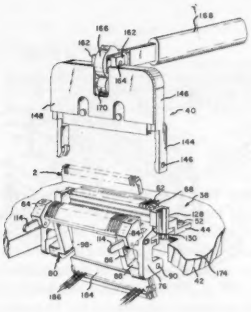
1. Apparatus for inserting conductors into the conductor-receiving portions of electrical contact terminals which are contained in an electrical connector, said connector being mateable with a complementary connecting device, said apparatus comprising:

frame means,

connector holding means on said frame means for holding said connector in a predetermined position, said connector holding means comprising a complementary connecting device removably mounted on said frame means,

conductor holding means for holding conductors adjacent to, and in alignment with, said conductor receiving portions preparatory to inserting of said conductors into said conductor-receiving portions,

conductor insertion means for moving conductors in said conductor holding means from said conductor holding



means into said conductor receiving portions of a connector mounted on said connector holding means whereby, upon mounting a connector on said connector holding means, locating conductors in said conductor holding means, and actuating said conductor insertion means, said conductors are inserted into said conductor-receiving portions of said terminals in said connector, said apparatus being adaptable to use with connectors of varying sizes upon removal of said complementary connecting device therefrom and replacement thereof with a different complementary connecting device.

3,885,288

METHOD OF DRAWING IN THE STATOR WINDING OF AN ELECTRIC MOTOR

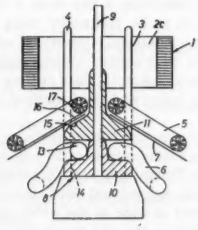
Egon Lund, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Division of Ser. No. 415,120, Nov. 12, 1973, Pat. No. 3,857,171. This application Aug. 30, 1974, Ser. No. 501,880

Claims priority, application Germany, Nov. 11, 1972, 2255345

Int. Cl. H02k *15/02*

U.S. Cl. 29—205 D **3 Claims**



1. Apparatus for inserting stator windings into grooves in a stator of an electric motor, the apparatus comprising a ring of pins the outside periphery of which corresponds to the inside periphery of the stator, an insertion head the outer periphery of which corresponds to the inside periphery of the stator, means mounting said insertion head for movement towards and away from the stator, recesses in said insertion head for engagement with said pins to guide said insertion head during said movement, and first and second pressure surfaces on said insertion head for applying pressure to respective ones of said windings to effect insertion of said windings into said grooves while at the same time said windings are guided by said pins, said two pressure surfaces being axially offset in the direction of said movement.

3,885,289

APPARATUS FOR INSTALLING BATTERY VENT PLUG

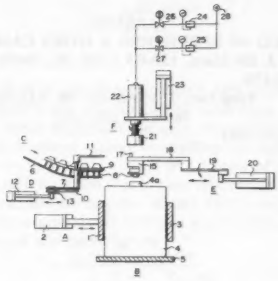
Teruaki Tanaka, Takatsuki, Japan, assignor to Yuasa Battery Company Limited, Takatsuki, Japan

Filed May 15, 1974, Ser. No. 470,315

Claims priority, application Japan, Nov. 20, 1973, 48-130904

Int. Cl. H01m *35/18;* **B23p** *19/04*

U.S. Cl. 29—204 R **4 Claims**



1. An apparatus for installing battery vent plug comprising a battery fixing means for fixing a battery, vent plug holding means for holding a vent plug supplied from a vent plug supplying means, vent plug catching means for catching the vent plug and bringing it to a vent of the battery, a vent plug screwing means for fitting the vent plug to the vent of the battery and a battery conveying means for conveying the battery fitted with the vent plug as operatively connected with one another.

3,885,290

DEVICE FOR INSTALLING AND REMOVING BIG-END CAPS OF CONNECTING RODS ON INTERNAL COMBUSTION ENGINES

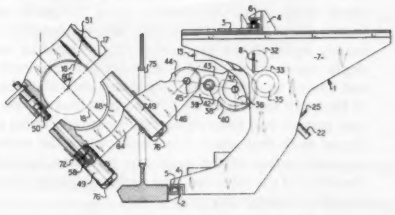
Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques, Saint-Denis, France

Filed Oct. 3, 1974, Ser. No. 511,679

Claims priority, application France, Nov. 9, 1973, 73.39988

Int. Cl. B23p *19/04*

U.S. Cl. 29—252 **16 Claims**



1. A device for installing and removing connecting rod big-end caps on and from an internal combustion engine,

wherein the improvement consists in that said device comprises:

a supporting frame including means for mounting the same on one side of the engine for horizontal movement along the engine over at least one portion of the length thereof; a first carriage mounted on said supporting frame and displaceable transversely thereof in a horizontal direction perpendicular to the path of travel of said supporting frame;

a second carriage mounted on said first carriage and displaceable thereon in a direction perpendicular to the joint interface plane between said cap and said connecting rod in a predetermined position of the latter;

a toggle system movable in a substantially vertical plane and pivotally connected at one end thereof to said second carriage while comprising at the other end holding means for supporting the connecting rod big-end cap; and

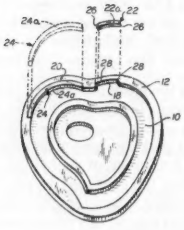
servo-control power means for operating at least said toggle system.

3,885,291

METHOD OF REBUILDING A WORN CAM SURFACE

Anthony J. DiChiara, 133-03 128th St., South Ozone Park, N.Y. 11420

Filed Dec. 7, 1973, Ser. No. 422,932
Int. Cl. B23p 7/00
U.S. Cl. 29—401 **7 Claims**



1. A method of rebuilding a worn section of a cam surface, wherein the worn section comprises less than the entire length of the cam surface, comprising the steps of:

removing the worn section of the cam surface and forming a recess in the cam surface at the location of the worn section, the recess having a predetermined length along the cam surface encompassing the portion of that surface which had been worn and the recess having a predetermined depth into the cam surface that is beneath the depth of the worn cam surface along that worn portion; forming a replacement wear strip having a length approximately equal to the predetermined length and having a depth approximately equal to the predetermined depth and having an outward surface that is shaped to the shape of the worn section of the cam surface that section of the cam surface had been worn; said wear strip being dimensioned such that when it is emplaced in the recess, the outward surface of the wear strip forms an integral continuation of the adjacent cam surface without presenting elevational discontinuities;

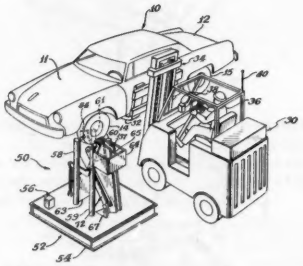
securing the replacement wear strip in the recess such that its outward surface is flush with and forms an integral continuation of the adjacent cam surface without presenting elevational discontinuities.

3,885,292

METHOD AND APPARATUS FOR CUTTING MOUNTED TIRES FROM THE WHEELS OF JUNKED VEHICLES

Allen B. Sharp, and Richard A. Hull, both of Ottumwa, Iowa, assignors to Al-jon Incorporated, Ottumwa, Iowa

Filed June 24, 1974, Ser. No. 482,520
Int. Cl. B23p 19/02
U.S. Cl. 29—403 **15 Claims**



1. Apparatus for cutting and removing a tire from a rim of a wheel on which the tire is mounted comprising:

a first member of preselected thickness forming a first cutting surface having an upper end and a lower end;

a second member forming a second cutting surface having an upper end and a lower end;

a third member forming a third cutting surface having an upper end and a lower end arranged adjacent the second member to form a slot in which the first member is movable between the second and third members in a first plane; and

operating means for moving the first member relative to the second and third members into an open position in which the upper end of the first cutting surface is displaced from the upper ends of the second and third cutting surfaces by a first space sufficiently large to receive the width of the tire to be cut and for moving the first member relative to the second and third members into a closed position in which the second and third cutting surfaces cooperate with and guide the first cutting surface to cut the tire from the rim.

12. A method of removing a tire from a rim of a wheel mounted on a vehicle to be junked by using a first cutting surface having an upper end and a lower end adapted to move within a slot formed by a second cutting surface having an upper end and a lower end and a third cutting surface having an upper end and a lower end, said method comprising the steps of:

raising the vehicle over the cutting surfaces;

moving the cutting surfaces to an open position in which the upper end of the first cutting surface is displaced from the upper ends of the second and third cutting surfaces by a first space at least as wide as the width of the tire;

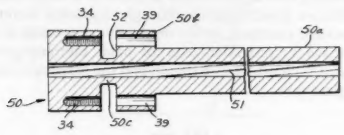
lowering the vehicle so that the tire is moved into the first space between the first cutting surface and the second and third cutting surfaces; and

moving the first cutting surface relatively toward the second and third cutting surfaces to a closed position in which the tire is severed by the cooperation of the cutting surfaces.

3,885,293
METHOD OF MAKING VENTED TEST BARREL ASSEMBLY FOR REVOLVER AMMUNITION

Charles H. Bateman, Jr., East Haven; Allan A. Campbell, Trumbull, and James J. Capasso, Shelton, all of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 347,381, April 3, 1973, Pat. No. 3,854,331. This application July 10, 1974, Ser. No. 487,055
Int. Cl. B23p 17/00
U.S. Cl. 29—416 5 Claims

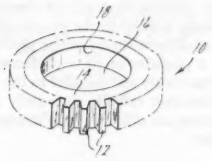


1. A method of manufacturing a test barrel assembly for testing a revolver cartridge from a metal blank, said method comprising the steps of forming a longitudinal passage through the metal blank, cutting the blank to form a barrel portion and a cylinder portion each including a section of the longitudinal passage, attaching the barrel portion to the cylinder portion with the sections of the longitudinal passage in axial alignment and with a gap of predetermined thickness between the barrel portion and the cylinder portion.

3,885,294
METHOD OF MAKING A BONDED SILICON NITRIDE ARTICLE HAVING PORTIONS OF DIFFERENT DENSITY

Gerald J. Chaundy, Livonia; Andre Ezis, Grosse Ile; Michael U. Goodyear, Plymouth; Benjamin T. Howes, Birmingham; Carl F. Johnson, Detroit, and Karsten H. Styhr, Farmington, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1974, Ser. No. 457,536
Int. Cl. B22f 7/06
U.S. Cl. 29—420 9 Claims

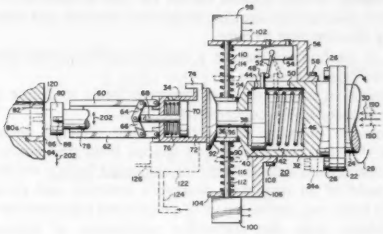


1. A method of making a duo density article of silicon nitride which comprises:
- forming a first article portion of silicon nitride by shaping silicon metal particles into a suitable configuration and nitriding the same;
- applying a release agent to selected surfaces of the first article portion;
- applying an encapsolent which is readily formable but of relatively low strength to the selected surfaces of the first article portion;
- converting the encapsolent to a high strength material;
- hot press bonding a second article portion of silicon nitride to a surface of the first article portion which has no encapsolent thereon;
- machining the encapsolent to remove portions thereof, the removal of such portions freeing other portions of the encapsolent to be removed as individual segments.

3,885,295
PROGRAMMED MANIPULATOR ARRANGEMENT FOR ASSEMBLING RANDOMLY ORIENTED PARTS

Joseph F. Engelberger, and Maurice J. Dunne, both of Newtown, Conn., assignors to Unimation, Inc., Danbury, Conn.

Continuation of Ser. No. 251,315, May 8, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 434,929
Int. Cl. B23p 19/00, 19/04
U.S. Cl. 29—429 37 Claims

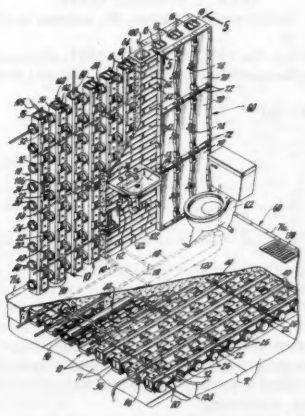


23. The method of interfitting one part with another part, said pair of parts being interfittable by movement along an insertion axis, which comprises the steps of supporting one of said parts at an insertion station, controlling a programmable manipulator arm to grasp the other of said pair of parts and move it along said insertion axis toward said one part at said insertion station, and moving one of said parts in a predetermined search area around said insertion axis, thereby to facilitate interfitting of said pair of parts.

3,885,296
METHOD FOR MAKING CAST-IN-PLACE CONCRETE STRUCTURES

Robert K. Stout, Hamburgo, num. 75, 9° piso, Mexico City, 6, D.F. Mexico

Filed July 11, 1974, Ser. No. 487,605
Int. Cl. B23p 19/04
U.S. Cl. 29—433 17 Claims



1. A method for making a cast-in-place concrete structure comprising the steps of:
- forming an arrangement of concrete forms to define the periphery of the concrete structure;
- placing a plurality of void creating devices within the confines of and spaced from said concrete forms, each device being an elongated hollow member made of frangible

material, and having at least one opposed pair of projections intermediate its length, with the respective projections of adjacent devices abutting one another in order to enable communication between said devices, and with the ends of the devices and the non-abutting projections thereof extending to the periphery of said concrete forms; and

forming the concrete structure by pouring uncured concrete into the space defined between said concrete forms and the void creating devices thereby embedding the void creating devices therein except for said ends of the devices and the non-abutting projections thereof, and allowing the concrete to cure.

13. A method for making a cast-in-place concrete structure comprising the steps of:

forming an arrangement of concrete forms to define the periphery of the concrete structure;

placing a plurality of insulating void creating devices within the confines of and spaced from said concrete forms, each device being an elongated hollow member made of an insulative, frangible material, and having at least one opposed pair of projections intermediate its length, with the respective projections of adjacent devices abutting one another in order to enable communication between said devices, and with the ends of the devices and the non-abutting projections thereof extending to the periphery of said concrete forms;

forming the concrete structure by pouring uncured concrete into the space defined between said concrete forms and the void creating devices so as to embed the void creating devices therein except for said ends of the devices and the non-abutting projections thereof, and allowing the concrete to be cured; and

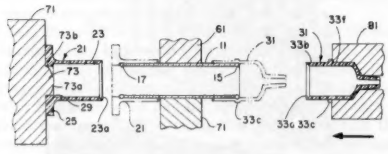
removing the concrete forms, and knocking out the exposed frangible projections of the void creating devices in order to provide access to the labyrinth of the passageways within said concrete structure.

3,885,297

METHOD OF ASSEMBLING GLASS TUBE AND THERMOPLASTIC RESIN FINGER GRIP AND NOSE SLEEVE SYRINGE BODY

Edward A. Tischlinger, Des Plaines, Ill., assignor to MPL, Inc., Chicago, Ill.

Division of Ser. No. 197,718, Nov. 11, 1971, abandoned. This application Mar. 18, 1974, Ser. No. 451,958
Int. Cl. B23p *11/02*
U.S. Cl. 29—450 **9 Claims**



1. The method of assembly of a medicant reservoir glass tube, a non-glass finger grip member and a non-glass nose-forming member to form a unitary pharmaceutical packaging subassembly, comprising

axially aligning and effective relative axial movement of a medicant reservoir glass tube and two opposing sleeves of thermoplastic resin, one of which sleeves has a tubular sheath section and a laterally extending finger grip thereon, and the other of which sleeves is a nose-forming sleeve having a tubular sheath section and a reduced diameter dispensing section, each of said sleeves being disposed with its sheath extending toward a respective open end of said glass tube, and effecting opposing axial motion of each of said sleeves toward and relative to said respective open ends and into coaxial engagement therewith to a point where said sleeve sheaths effectively encompass a substantial longitudinal wall extent at each respective end of said tube, and lie in intimate intersurface contiguity thereabove,

said thermoplastic resin sleeve sheath sections each having an internal relaxed diameter prior to assembly and when at normal room temperatures of approximately 70°F, of less diameter than the effective outer diameter of the respective end of said glass tube,

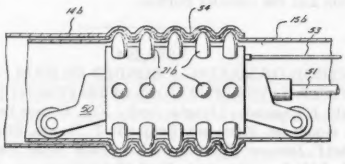
and camming said sleeve sheath sections to a larger stretch-fit effective inner diameter through sequential incremental outward camming action on the sleeve sheaths at each successive incremental zone of axial interengagement between each said sleeve sheath and the respective end of said glass tube.

3,885,298

METHOD OF SEALING TWO TELESCOPIC PIPES TOGETHER

Ivo C. Pogonowski, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 247,584, April 26, 1972, Pat. No. 3,795,035. This application Sept. 28, 1973, Ser. No. 401,742
Int. Cl. B21d *39/00;* **B23p** *11/02*
U.S. Cl. 29—507 **4 Claims**



1. A method for sealing together two telescopic pipes comprising the steps of

a. rolling a swaging mechanism centrally along the inside of the pipes to adjacent an end of one of the pipes,

b. deforming a circular first row of dimples through both pipes in a plane normal to the pipe longitudinal axis in a direction radially outwardly of the pipes and

c. deforming a plurality of rows of dimples through both pipes simultaneously and parallel to the first row of dimples in a direction radially outwardly of the pipes for quickly forming an efficient high strength joint between the two pipes.

3,885,299

METHOD OF INTERLOCKING OVERLYING SHEETS

Otto P. Hafner, 1321 Paddock Way, Cherry Hill, N.J. 08034

Division of Ser. No. 384,494, Aug. 1, 1973. This application Aug. 16, 1974, Ser. No. 497,884
Int. Cl. B23p *11/00*
U.S. Cl. 29—521 **1 Claim**

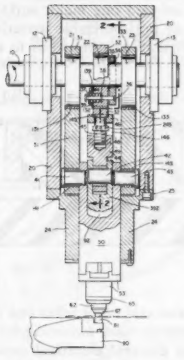
1. A method of locking together overlying sheets of deformable material, said method comprising:

a. piercing first and second overlying sheets discontinuously along a boundary line defining an area;

b. displacing the material of said first and second sheets within said area out of the planes of the non-displaced first and second sheet material until the exterior surface of the displaced first sheet material is just beyond the plane of the exterior surface of the non-displaced second sheet material; and

c. compressing together the displaced material of said first and second sheets while confining the displaced material

of the second sheet to limit its outward spread and to spread outwardly the displaced first sheet material over



the outer surface of the non-displaced second sheet material beyond the edges of the piercings therein.

3,885,300

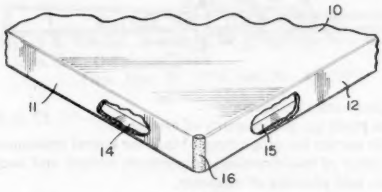
METHOD OF MAKING A PANEL CORNER

Frank A. Hoffman, and Layton L. Hinson, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed June 12, 1974, Ser. No. 478,636

Int. Cl. B23p *17/00*

U.S. Cl. 29—527.1 **7 Claims**



5. A method of making a corner for a panel, comprising the steps of cutting a sheet of metal to form a pair of first edges at an angle to each other and a pair of second edges extending inwardly from said first edges at points equally spaced from what would otherwise be the juncture of said first edges whereby said second edges define a cut-out portion at the corner of said sheet, said cutting operation defining an arcuate segment in said sheet interconnecting the adjacent ends of said second edges; bending said sheet along a pair of bend lines parallel to said first edges and extending longitudinally from the ends of said arc segment whereby the metal between said bend lines and first edges forms a pair of skirts whose adjacent ends are in spaced relation and are defined by said second edges; placing said metal in a mold; injecting an adhesive filler into said mold to fill the space between said second edges and bridge across the adjacent ends of said skirts; and curing said adhesive filler into a rigid state.

3,885,301

PYROELECTRIC ELEMENT OF POLYMER FILM

Naohiro Murayama, Iwaki, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

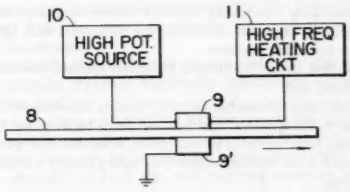
Division of Ser. No. 242,448, Apr. 10, 1972, Pat. No. 3,794,986.

Filed Nov. 9, 1972, Ser. No. 305,036

Claims priority, application Japan, Apr. 8, 1971, 46-21374; Apr. 27, 1971, 46-27159

Int. Cl. H04r *31/00*

U.S. Cl. 29—592 **11 Claims**



1. A process of producing a pyroelectric element having a nonuniform distribution of pyroelectricity along the surface thereof, which comprises polarizing desired local portions of a polymer film, which can be converted into a pyroelectric substance by applying an electric potential to said film, while varying at least one of the temperature and the electric potential at each of the local portions relative to other portions of the film.

3,885,302

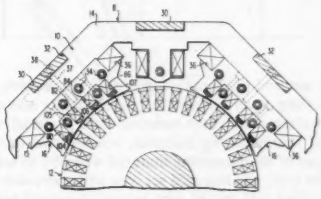
METHODS OF MAKING DYNAMOELECTRIC MACHINERY

Walter F. Boesel, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 383,174, July 27, 1973, Pat. No. 3,859,549. This application Sept. 27, 1974, Ser. No. 509,977

Int. Cl. H02k *15/02*

U.S. Cl. 29—596 **6 Claims**



1. A method of assembling a dynamoelectric machine comprising the steps of:

adjacently disposing together a plurality of yoke plates;

orienting said yoke plates such that grooves along the outer peripheries thereof are aligned to form a plurality of grooves;

inserting attachment flanges into said grooves and bonding said attachment flanges to said yoke plates;

assembling a plurality of pole shoes, each pole shoe being assembled by:

adjacently disposing and securing together a plurality of base plates to define a base section,

adjacently disposing together a plurality of tip plates,

orienting said tip plates to define a tip section having a curved pole face, with apertures in said tip plates being aligned to define at least one opening extending through said tip section remote from said pole face,

inserting a connector bar through said opening,

clamping said tip plates together by clamping elements located at the ends of said connector bar,
aligning said base and tip sections such that wall portions of said base and tip sections define a plurality of slots,
inserting compensator coil windings in said slots,
inserting a cluster of strand-like elements in each of said slots between said wall means and said compensator coil windings,
inserting liquid binder material into said slots and allowing said binder material to cure so as to bond said elements together and to said wall means to define rigid braces supporting said compensator coil windings against oscillation in said slots, and
connecting releasable fastener means between said base section and said connector bar to secure said tip section to said base section;
inserting primary current windings around said base sections; and
connecting releasable fastener means between said attachment flanges and said base sections to detachably secure said base sections to said yoke, with shoulder portions of each base section supporting said primary current windings;
the arrangement being such that said primary current windings can be released from said base section in the absence of removing said tip section from said base section.

3,885,303

METHOD OF MANUFACTURING FUSES

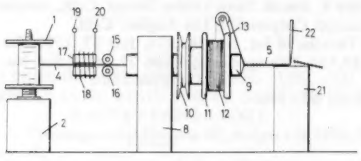
Gerardus J. Deelman, Eindhoven, Netherlands, assignor to Olvia Smeltzekeringen Fabriek N.V., Utrecht, Netherlands

Division of Ser. No. 180,786, Sept. 15, 1971, Pat. No. 3,845,439. This application Sept. 23, 1974, Ser. No. 508,714

Claims priority, application Netherlands, Sept. 15, 1970, 7013620

Int. Cl. H01h *69/02*

U.S. Cl. 29—623 **1 Claim**



1. A method of manufacturing fuses, comprising the steps of providing a very thin wire of electrically non-conductive, heat-insulating and heat-resistive fibre material with a thin layer of thermosetting material, heating said thin wire with said layer of thermosetting material whereby to set or rigidify said thin wire, winding said set wire with extremely thin metal wire, cutting said wound wire in predetermined segments and mounting said segments in suitable fuse containers.

3,885,304

ELECTRIC CIRCUIT ARRANGEMENT AND METHOD OF MAKING THE SAME

Anton Kaiser; Helmut Keller, both of Reutlingen, and Adolf Kugelmann, Leonberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

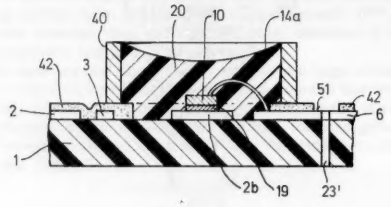
Division of Ser. No. 337,742, March 2, 1973. This application Dec. 27, 1973, Ser. No. 428,910

Claims priority, application Germany, Mar. 23, 1972, 2214163; May 31, 1972, 2226395

Int. Cl. H05k *3/28*

U.S. Cl. 29—627 **10 Claims**

1. A method of making an electric circuit arrangement, comprising the steps of providing an electrically insulating circuit board having opposite major surfaces and holes extending intermediate said surfaces and electrically conductive circuit strips on both of said major surfaces; mounting on one of said major surfaces a semiconductor unit having exposed electrical terminals; electrically connecting said terminals with respective ones of said strips using bond wires; mounting surround means defining a chamber around said mounted semiconductor unit on said one major surface; depositing a protective covering of polymerizable material into said surround means of sufficient quantity so as to encapsulate said



semiconductor unit and said bond wires and form a meniscus above said semiconductor unit; mounting on said one major surface a plurality of discrete electrical components having conductive leads which extend through said respective ones of said holes to said other major surface and to respective circuit strips thereof; and soldering said leads at said other major surface to the respectively associated circuit strips by contacting said leads with a surge-deposition soldering bath.

3,885,305

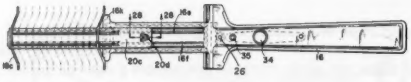
HAIR CUTTERS

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 340,379, March 12, 1973, Pat. No. 3,855,696, which is a continuation-in-part of Ser. No. 321,343, Jan. 5, 1973, Pat. No. 3,855,695. This application Mar. 13, 1974, Ser. No. 450,581

Int. Cl. B26b *21/12, 21/40*

U.S. Cl. 30—30 **30 Claims**



6. A hair cutter comprising:
a cage made up of a plurality of elements,
a blade carrier for supporting a blade for lateral movement in either of two directions respectively toward and away from said plurality of elements,
driving means engaging said blade carrier for producing said lateral movement, and
means for moving said cage longitudinally with respect to said blade carrier including means adjustable from a first haircutting position to a contraining position for unobstructed removal and replacement of said blade.

3,885,306

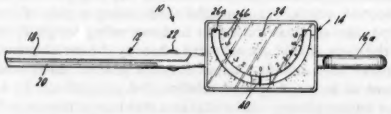
SCISSORS AND POSITION INDICATOR

Jack J. Herman, 3 Prince St., Spring Valley, N.Y. 10977

Filed May 17, 1974, Ser. No. 470,728

Int. Cl. B26b *13/22*

U.S. Cl. 30—123 R **6 Claims**



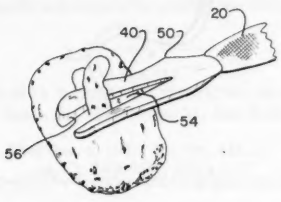
1. A combination of a scissors and position indicator comprising a scissors having a handle, an indicator housing

mounted on said handle, said housing including an indicator dial, and indicating means within said housing and movable relative to said indicator dial for indicating the position of said scissors.

3,885,307
PEELING UTENSIL

William A. Papalardo, 63 Little Neck Rd., Centerport, N.Y. 11721

Continuation-in-part of Ser. No. 249,609, May 1, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,132
Int. Cl. A47j *17/02, 17/04*
U.S. Cl. 30—123.5 **13 Claims**

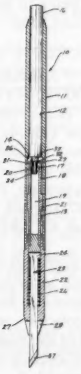


1. A peeling utensil comprising an elongated handle and an elongated blade attached at one end to said handle, said blade curved downward at least in part in longitudinal section from the handle and having at least one side edge concave at least in part, a substantially convex bottom surface, and an open ended slot extending from the other end of said blade for a distance along its axis, wherein the edges of the slot are sharpened to provide cutting edges which are tapered upwardly and outwardly from said bottom surface, and said blade side edges are sharpened in a direction opposite to the direction the respective adjacent slot edges are sharpened, and said sharpened blade side edges are blended with said sharpened slot edges adjacent the open end of said slot.

3,885,308
RETRACTIBLE TOOL HOLDER

Myron K. Gordin, Oskaloosa, Iowa, assignor to G & L Industries, Inc., Oskaloosa, Iowa

Filed June 28, 1974, Ser. No. 484,099
Int. Cl. B26b *1/08*
U.S. Cl. 30—162 **4 Claims**

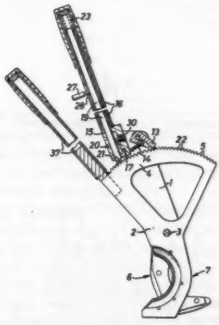


1. A retractible tool holder comprising:
a. a tubular barrel member having a front end and a rear end and a bore with a front section and rear section, said rear section of a reduced diameter relative to said front section to form an annular stop shoulder.
b. a tool carrying member having a front end and a rear end,
c. a working tool extended forwardly from the front end of the tool carrying member,
d. said tool carrying member slidably movable within said bore between an inoperative position wherein the working tool is retracted inwardly from the front end of said barrel member and an operative position wherein the working tool projects outwardly from the front end of said barrel member,
e. a manually operable actuating member located within and movable longitudinally of the bore rear section,
f. a lost motion means connecting together the forward end of said actuating member with the rear end of the tool carrying member,
g. means within the bore front section yieldably urging the tool carrying member rearwardly toward said actuating member, and
h. means coacting with said lost motion means and movable in response to a forward movement of said actuating member into releasable locking engagement with said stop shoulder to lock the tool carrying member in the operating position therefor, and movable in response to a rearward movement of said actuating member to release said tool carrying member for movement to the inoperative position therefor.

3,885,309
CABLE CUTTERS

Alfred Ernest Lund, Reading, and Kenneth Harry Holbrook, Aldermaston, both of England, assignors to The Post Office, London, England

Filed Feb. 13, 1974, Ser. No. 442,229
Claims priority, application United Kingdom, Feb. 19, 1973, 7968/73
Int. Cl. B26b *13/04*
U.S. Cl. 30—250 **15 Claims**



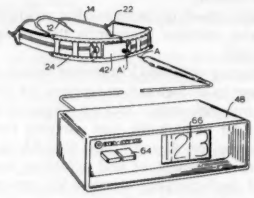
1. Apparatus for severing cables and the like comprising first and second co-operating severing jaws formed respectively at one end of each of first and second pivotally connected first-order levers, said first first-order lever having integral therewith a fulcrum member having notches directly engageable by one end of a second-order lever, said second-order lever being pivotally mounted relative to said second first-order lever at a point spaced from the end of said second-order lever to provide a drive transfer pivot at said point, and wherein said notches provide successive fulcrums for said second-order lever during oscillatory movement thereof so that during pivotal movement in a first direction of said second order lever, relative rotation is effected between said first-order levers in a jaw closing direction and during pivotal movement of the second-order lever in the opposite direction.

retaining means interengageable between said second first-order lever and said fulcrum member prevents relative rotation of the first-order levers in a jaw opening direction and actuating means associated with the second-order lever effects relocation of the end of the second-order lever in the next adjacent notch.

3,885,310
ORTHODONTIC APPLIANCE

Michael E. Northcutt, 1704 Miramonte, Mount View, Calif. 94040

Continuation-in-part of Ser. No. 302,734, Nov. 1, 1972, abandoned. This application June 15, 1973, Ser. No. 370,445
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 D **18 Claims**

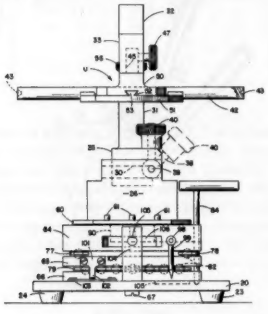


1. A removable orthodontic appliance comprising means for exerting corrective forces on teeth, said appliance also including means for sensing when the appliance is being used and means responsive to said sensing means for recording the amount of time the appliance is in use on the patient.

3,885,311
DENTAL ARTICULATOR

John K. Lawler, 1740 W. Gardena Blvd., and John W. Mitchell, Sr., 1701 W. 168th St., both of Los Angeles, Calif. 90247

Filed Sept. 17, 1973, Ser. No. 398,258
Int. Cl. A61c *11/00*
U.S. Cl. 32—32 **20 Claims**



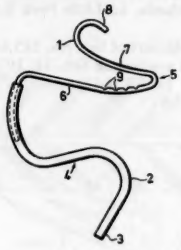
1. A dental articulator characterized by opposing mounts adapted to dispose respective upper and lower dentures in functional positions of mutual engagement, one of which mounts may be secured against lateral displacement while the opposing mount is held upon a plate which is adapted for transverse linear displacement within an area encompassed by a closed path lying along the plane of mutual engagement,

and means for self-aligning upright oscillation of said plate by tilting transverse to a generally central axis through said dentures perpendicular to said plane of mutual engagement, in response to said lateral displacement, which displacement causes said oscillation by movement of one denture transverse to the cusps of the other.

3,885,312
SALIVA EXTRACTOR

Elling Harald Nordin, Villa Svedia en Tortiguet 12, Villeneuve, Vaud, Switzerland

Filed Aug. 30, 1973, Ser. No. 392,905
Int. Cl. N61c *11/00*
U.S. Cl. 32—33 **1 Claim**



1. A two-part saliva extractor device which is characterized by:

a. a first tube that is primarily intended to be positioned on the outside of the mouth of a dental patient,
b. a second tube that is primarily intended to be positioned on the inside of the mouth of a dental patient,
c. said first tube having a first end that is adapted to be connected to a suction line,
d. said first tube having a curvature somewhat similar to the letter S, one portion of which is adapted to fit against the front outside portion and the exterior underside of a dental patient's chin,
e. said second tube having a curvature which resembles the combination of an L section and a J section joined together at the upper ends of their "long leg" portions so as to form a V therebetween,
f. the short leg portion of the L section of said second tube fitting telescopically within the outer end of said first tube so that the combined shape of said L section and said first tube is a generally U-shaped clamp that fits around the chin and lower mouth portion of a dental patient,
g. said second tube having suction holes therein,
h. said J section of said second tube being shaped to hold a piece of cotton,
i. the portions of said first and second tubes that telescope together being in the form of moderate arcs, and
j. said section holes being in the long leg portion of the L section of said second tube.

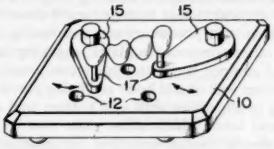
3,885,313
ARTIFICIAL TOOTH SUPPORTER FOR HEAT TREATMENT

Zenichi Kikuchi; Keijyo Yamada, and Tatuo Kimura, all of Tokyo, Japan, assignors to Fujishiken Ltd., Tokyo, Japan

Filed July 18, 1973, Ser. No. 380,235
Claims priority, application Japan, July 20, 1972, 47-72050; Dec. 7, 1972, 47-139949
Int. Cl. A61c *3/00*
U.S. Cl. 32—40 R **11 Claims**

1. An artificial tooth supporter for supporting artificial teeth when they are subjected to heat treating comprising a base plate formed with at least one recess in its upper surface, at lease one cylindrical column vertically upwardly projecting from the upper surface of the base plate, at least one movable member formed with a circular hole to be complementarily and detachably engaged with the column so that the movable member can be rotated about the column on the upper surface of the base plate, and first and second artificial tooth supporting pins for supporting the artificial teeth on their upper ends, said first supporting pin being upwardly projecting from the

movable member and spaced from the circular hole, and said second supporting pin having at its lower end a fitting portion



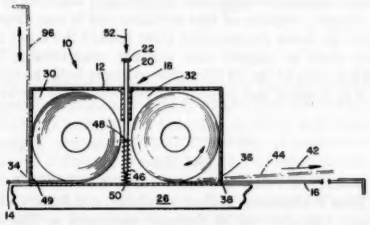
to be frictionally and detachably inserted into the recess of the base plate.

3,885,314

TWO-WAY TAPE AND CENTERING DEVICE

Andrew J. Banas, Sr., 250 Taraval St., San Francisco, Calif. 94116

Filed Dec. 6, 1973, Ser. No. 422,291
Int. Cl. B43l *9/04;* **G01b** *3/10*
U.S. Cl. 33—27 C **5 Claims**



1. A two-way measuring and centering device comprising: a housing having first and second mutually aligned compartments, said housing having oppositely directed complementary openings in the respective compartments;

first tape measure means located within the first compartment and having a first tape extensible through the opening in said first compartment in a first direction;

second tape measure means located within the second compartment and having a second tape extensible through the opening in the second compartment in a second opposite direction independently of the first tape measure means; and

scribe means projecting through the housing intermediate the first and the second tape measure means, said scribe means including an elongate shaft having a first sharply pointed end and a second opposite generally flat end so that the shaft can be depressed at the flat end to inscribe a mark with the pointed end.

3,885,315

CURB MARKING GAGE

Luigi Polselli, 230 Parkway Blvd., and Rudolph T. Polselli, 213 Croft Ridge Dr., both of Broomall, Pa. 19008

Filed Aug. 31, 1973, Ser. No. 393,423
Int. Cl. B43l *13/02*
U.S. Cl. 33—42 **2 Claims**

1. In a curb marking gage for use with a curb having a horizontal surface and a vertical surface, the combination of

A. a frame;

B. a plurality of curb contacting members attached to the frame to permit horizontal movement of the frame relative to the curb,

1. a first portion of said curb contacting members rolling over the vertical surface,

2. said first portion having inner extremeties which contact the vertical surface,

a. the inner extremeties defining a vertical plane;

C. a socket affixed in pivotal relation to the frame

1. said socket being provided with a vertically disposed opening,

2. said socket having no vertical movement relative to the frame;

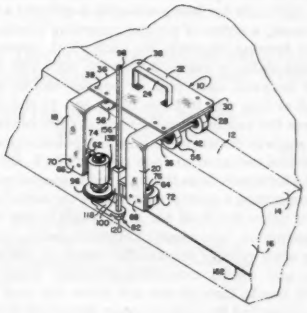
3. the socket having pivotal movement relative to the frame from an initial position to a curb marking position,

D. curb marking means carried by said socket in a vertically adjustable manner relative to the frame to place a mark upon the vertical surface of the curb,

1. said curb marking means including a circular brush, a paint reservoir, a spring, a strut and bracket assembly comprising a strut and a bracket, said assembly being pivotally connected and an affixed gage rod,

2. a portion of the periphery of said circular brush being positioned inwardly of the vertical plane when the socket is in its initial position,

3. the periphery of said circular brush being forced against the vertical surface when the socket is urged to its curb marking position,



4. the spring continuously biasing said socket and said circular brush into contact with the vertical surface when the curb contacting members are positioned in contact with the curb,

5. the gage rod being vertically movable within the socket to a plurality of vertical positions relative to the frame to vary the height of the brush relative to the frame,

a. means to retain the gage rod in any of the vertical positions to maintain the circular brush at a desired elevation relative to the vertical curb surface,

6. the gage rod terminating downwardly in a strut connection end,

a. a strut rigidly connected to said end and extending therefrom to provide an extension, the said circular brush being connected to said extension in a rotatable junction whereby the circular brush freely rotates for curb marking purposes when the circular brush is biased into contact with the vertical surface and when the curb marking gage is moved longitudinally relative to the curb,

7. the paint reservoir feeding paint to the circular brush,

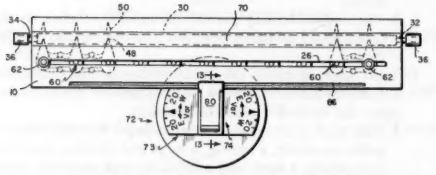
a. said paint reservoir and said circular brush being affixed to the strut in spaced relationship from the gage rod,

b. said paint reservoir being provided with paint flow control means to regulate the volume of paint flow to the said circular brush.

3,885,316
NAVIGATIONAL INSTRUMENT

Ray J. Casten, 143 Walnut St., Natick, Mass. 01760

Filed Apr. 19, 1973, Ser. No. 352,523
Int. Cl. G06g 1/02
U.S. Cl. 33—75 R 18 Claims

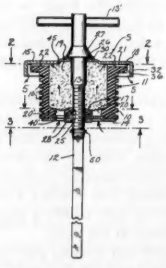


1. A navigational instrument comprising an elongate top wall along the long sides and ends of which there are side and end walls, the side walls being parallel and in conjunction with the end walls defining an elongate cavity at the underside of the top wall, said top wall containing lengthwise thereof and parallel to said side walls a slot of predetermined width, a rigid rod mounted within the cavity at the underside of the top wall with its opposite ends journaled in the end walls, a scale bar mounted within the cavity at the underside of the top wall parallel to the rigid rod with its ends journaled in the end walls, said scale bar being rotatable to present a selected scale uppermost, a series of pointer mounting blocks, transversely spaced bearing elements on each block containing aligned openings slidingly engaged with the rigid rod, links of equal length between each pair of pointer blocks pivotally connected at one end to each other and to the block midway between the bearing elements and at their other ends to each other midway between the adjacent pointer blocks, and pairs of pointers mounted to each pointer block, said pointers extending forwardly from the rigid rod in spaced parallel relation and comprising a scale pointer above the scale bar and a chart pointer below the scale bar in the plane of the bottom side of the instrument, said chart pointer extending beyond the end of the scale pointer so as to be visible on the surface of the chart, and means extending upwardly from the endmost pointer blocks through the slot in the top wall for extending and contracting the scale pointers along said scale bar and the chart pointers correspondingly along the chart.

3,885,317
OIL LEVEL TESTING DIP STICK AND CLOSURE

Albert J. Karls, Greenville, Miss., assignor to Moeller Mfg. Co., Inc., Greenville, Miss.

Filed Sept. 25, 1967, Ser. No. 670,180
Int. Cl. G01f 23/04
U.S. Cl. 33—126.7 1 Claim

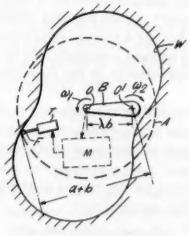


1. An oil level testing dip stick and closure for sealing the entrance throat of an oil filler spout of an internal combustion engine including, a resilient expandable and compressible stopper body having a bottom wall and an enlarged axial chamber opening out on the upper end of the body, the upper end of said body having an extended circumferential peripheral lip, said bottom wall being provided with a series of spaced apertures in open communication with said chamber and an axial bore therethrough, a filtering plug of a size and configuration to fit within said enlarged axial chamber, said filtering plug being of a porous nature and having an axial bore, inner and outer compression plates, engaging the opposite ends of said stopper body, the inner compression plate engaging the bottom wall of said body and being provided with an axial opening in alignment with said bottom wall and said filtering plug, said inner compression plate also being provided with a series of spaced apertures so constructed and arranged that regardless of the relative position of the inner compression plate relative to the bottom wall one or more of the respective apertures will be in open registration, said outer compression plate engaging the upper surface of the expandable body adjacent said lip and being provided at its axial center with an opening, the outer end of said outer compression plate extending beyond said circumferential lip and having a depending flange spaced therefrom, a rod rotatably mounted in the opening of the outer compression plate and having a reduced threaded portion extending through the opening of said bottom wall of said body, a threaded nut securred in the opening of said inner compression plate and engaging said reduced threaded portion of said rod, the upper surface of said circumferential lip being provided with a series of grooves communicating with the enlarged chamber of said body, whereby rotation of said rotatable rod in one direction will draw the inner compression plate toward the outer compression plate to expand said resilient compressible body against the walls of the oil filler pipe to firmly hold the closure and rod in position and provide for the venting of the crankcase.

3,885,318
SURFACE PROFILE TESTING INSTRUMENT

David John Whitehouse; Melton Mowbray, and Robert Claude Spragg, Leicester, all of England, assignors to The Rank Organisation Limited, London, England

Filed July 12, 1973, Ser. No. 378,667
Claims priority, application United Kingdom, Aug. 17, 1972, 38415/72
Int. Cl. G01b 5/20, 7/28
U.S. Cl. 33—174 L 9 Claims



1. An instrument for testing the profile of a surface of an object having a nominal shape which is non-circular, said instrument comprising:

a surface transducer having a feeler adapted to engage the surface of the object;

mounting means for the object under test, rotatable about a first axis;

support means carrying said mounting means, said support means being rotatable about a second axis spaced from and parallel to the first axis;

means supporting the transducer at a fixed position relative to said second axis,

and drive means for effecting rotation of the mounting means about the first axis and rotation of the support

means about the second axis to cause the feeler to move over the surface of the object,

wherein the resultant path traced by the feeler relative to said surface of the object under the action of said drive means conforms to said nominal shape, the transducer being responsive to departures of said surface from said nominal shape.

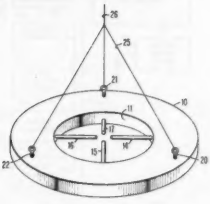
3,885,319
PLUMMET

Ernest J. Rollband, Green Acres Mobile Home Park, 3415 Slaterville Rd., R.D. No. 1, Brooktondale, N.Y. 14817

Continuation-in-part of Ser. No. 153,282, June 15, 1971, abandoned. This application June 25, 1973, Ser. No. 373,499

Int. Cl. G01c *15/10, 15/08*

U.S. Cl. 33—392 **3 Claims**



1. A plummet assembly including a suspendable plummet comprising a disc-shaped body with at least the lower surface of said body being substantially flat, an inner wall of said body defining a central aperture, a plurality of pointers on said inner wall extending toward the center of said aperture defining the center of gravity of said disc-shaped body, said pointers indicating the center at the intersection of the imaginary lines drawn therethrough; and suspension means for said disc-shaped body on the upper surface thereof for holding said body in position parallel to the work surface, the flat lower surface of said body being adapted for stable seating upon a substantially planar support surface; and an accessory plummet disc comprising a disc-shaped body having substantially flat upper and lower surfaces and substantially of the same diameter as the disc-shaped body of said suspendable plummet said suspendable plummet being alignable with said accessory plummet disc disposed upon a reference surface and functioning as a target therefor.

3,885,320
METHOD FOR TRANSFER OF FREEZE-DRIED SPECIMENS

Stuart Arthur Hodson, 24 Westgate St., Glamorgan, Wales, and John Marshall, The White House, Frimley Rd., Ash Vale, Surrey, England

Filed May 31, 1973, Ser. No. 365,607

Claims priority, application United Kingdom, June 1, 1972, 25634/72

Int. Cl. F26b *5/06*

U.S. Cl. 34—5 **4 Claims**

1. The method of transferring freeze-dried specimens from a first apparatus to an evacuated chamber of a second apparatus comprising:

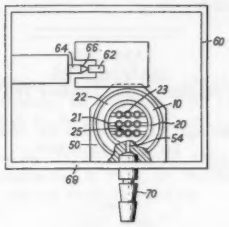
placing in communication with the casing of a first apparatus an air-tight transfer container separable from and movable independently of said first and second apparatus, said first apparatus including a casing, a specimen holder and a microtome having a knife operable to cut thin sections from a frozen specimen of biological material held in said specimen holder, said casing surrounding said knife and specimen holder;

cutting thin sections from said frozen specimen of biological material;

cooling the interior of the transfer container;

inserting into the transfer container sections of said frozen specimen from said first apparatus;

evacuating the interior of said transfer container;



sealing the transfer container;

removing the transfer container from the first apparatus; and

transferring the transfer container to the second apparatus and effecting communication between the interior of the transfer container and the evacuated chamber of the second apparatus.

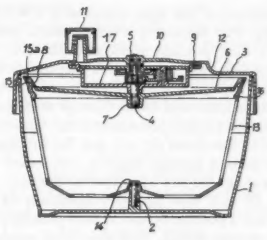
3,885,321
DOMESTIC APPLIANCE FOR DRYING VEGETABLES

Gilberte Fouineteau, Avenue Francois Devosge, 70100-Gray, France

Filed Oct. 25, 1973, Ser. No. 409,457

Int. Cl. F26b *17/24*

U.S. Cl. 34—58 **11 Claims**



1. A lightweight manually stabilized domestic appliance for drying vegetables comprising:

a container having a solid bottom and a solid side wall,

a vertical pivot placed at the center of the bottom,

a cover for closing the container and completely manually removable readily therefrom by merely lifting off said cover,

a manually operated rotatable crank mounted on the cover and disposed to circumscribe only part of the top of said cover when rotated to provide a non-crank interfering area in another part of the top of said cover for manually immobilizing said container during crank rotations,

rotation coupling means connected to said crank and suspended horizontally inside the cover and removable therewith by said lifting,

a removable vegetable basket which has a bottom provided with a recess to receive said pivot from which it is readily manually liftable when said cover is removed,

said basket having a perforated side wall terminating in an upper edge,

said upper edge of the side wall of the basket providing, during rotation, a second coupling means complementary

to the said rotation coupling means suspended in the cover,

said two coupling means fitting one with the other when the cover is placed on the container so that said basket is rotated when said crank is rotated and said container is held immobile.

3,885,322

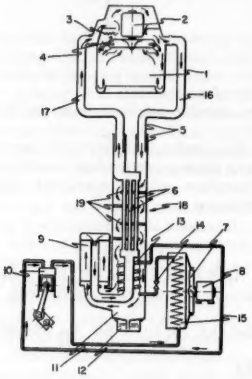
HAIRDRYERS

Salvador Gali Mallofre, Calle Londres 29-1°-2ª, Barcelona, Spain

Filed Apr. 22, 1974, Ser. No. 463,174

Int. Cl. A45d *20/24*

U.S. Cl. 34—100 **3 Claims**



1. In a hairdryer of the type comprising a hood; a conventional cooling unit including drying means comprising an evaporator; a first passage from said hood to said drying means; a second passage from said drying means to said hood; blower means including a motor located in said hood for forcing moist air from said hood through said first passage to said drying means to cool and remove the moisture from said moist air and to thus form dry air, and for forcing said dry air through said second passage back to said hood; and heating means for heating said dry air; the improvement wherein:

a portion of said first passage, upstream of said drying means, and a portion of said second passage, downstream of said drying means, comprise heat exchange means between said moist air and said dry air for precooling said moist air and for preheating said dry air to a temperature capable of cooling said blower motor; and wherein said heating means is positioned to heat said dry air after cooling contact thereof with said blower motor.

3,885,323

SIGNAL CONVERSION SYSTEM

Frederick C. Kaase, Sunnyvale, and Wilson C. Selden, San Jose, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed Mar. 1, 1973, Ser. No. 337,225

Int. Cl. G09b *9/00*

U.S. Cl. 35—10.4 **26 Claims**

26. A system for converting a first video signal which varies in accordance with radar ground range into a second video signal which varies in accordance with radar slant range, said system comprising:

a. an analog-to-digital converter for periodically sampling said first video signal, and for converting said first video signal into digital numbers;

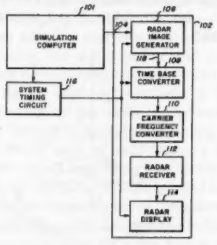
b. a random access memory having a data input coupled to the output of said converter and disposed for storing said digital numbers;

c. means for generating a first digital number representative of the instantaneous differences between a first signal proportional to radar ground range and a second signal proportional to radar slant range;

d. first means for producing a second number uniformly increasing in value;

e. means for combining said first number with said second number;

f. means coupling the output of said combining means to the address input of said memory during a first time interval, wherein said combined first and second numbers are utilized for addressing the memory for storing said digital numbers in said memory;



g. second means for producing a third number uniformly increasing in value;

h. means coupling the output of said second producing means to the address input of said memory during a second time interval, wherein said third number is utilized for addressing said memory for retrieving said digital numbers from said memory; and

i. a digital-to-analog converter for converting the digital numbers retrieved from said memory into an analog form, wherein said analog form is said second video signal which varies in accordance with said second mathematical function.

3,885,324

METHOD AND DEVICE FOR TEACHING SAFE DRIVING

Alvan F. Davenport, 41 Rancho Vista, El Sobrante, Calif. 94803; Ralph F. Gerken, 5549 Sapunor Way, Carmichael, Calif. 95608, and Jacob H. Wiens, 130 Crest Rd., Woodside, Calif. 94062

Filed Jan. 2, 1974, Ser. No. 430,232

Int. Cl. G09b *9/04*; **G01p** *15/08*

U.S. Cl. 35—11 **8 Claims**

1. A device for sensing acceleration and decelaration of a vehicle comprising:

a. a closed tubular system having:

1. a pair of spaced vertical tubes;

2. a first generally horizontal tube connecting the lower ends of said spaced vertical tubes and extending outwardly therefrom;

3. a second generally horizontal tube connecting the upper ends of said spaced vertical tubes;

4. first and second connecting tubes each connecting an end of said first horizontal tube with one of said vertical tubes adjacent the lower end of said vertical tubes;

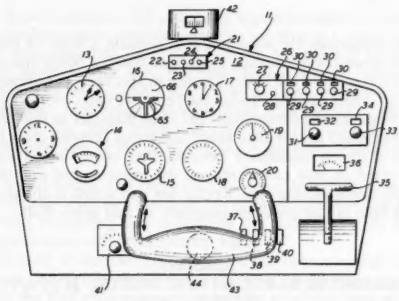
b. a plurality of height gradient indicia marks spaced at ascending intervals on said vertical members for indicating the height of said fluid in said vertical tubes during acceleration or deceleration of said vehicle; and

c. said tube system containing sufficient fluid to fill a portion of said first horizontal tube, all of one of said connecting tubes and a portion of said vertical tube to a height as great as the highest indicia marks on each of said vertical tubes.

3,885,325
FLIGHT SIMULATOR

Joseph E. Sidoti, Red Bank, N.J., assignor to Electronic Associates, Inc., Long Branch, N.J.

Filed Aug. 3, 1971, Ser. No. 168,718
Int. Cl. G09b *9/08*
U.S. Cl. 35—12 F **12 Claims**



1. Flight simulator for simulating actual flight conditions of an aircraft having a nose and wings, comprising:

a. a shaft mounted rotatably and axially movable;

b. a manually operable yoke secured to said shaft and for rotating and moving said shaft axially;

c. air speed indicator means operatively interconnected to said shaft and responsive to axial movement thereof to provide a change in indication of air speed;

d. altimeter means operatively connected to said shaft and responsive to axial movement thereof to provide a change in indication of altitude;

e. artificial horizon means including a rotatable artificial horizon disc divided into two hemispheres by a dividing line corresponding to the horizon, one hemisphere indicating the sky and the other the ground, and said disc being operatively connected to said shaft and being rotatable continuously through 360° in either direction in response to the rotation of said shaft, and further including a T-bar operatively interconnected to said shaft and being moved upwardly and downwardly in response to axial movement thereof, and upon being moved upwardly and downwardly said T-bar indicating the position of said nose of said aircraft relative to the horizon, and upon said artificial horizon disc being rotated relative to said T-bar said T-bar and said disc cooperatively indicating the relative inclination of said aircraft wings with respect to the horizon;

f. magnetic compass means operatively interconnected to said shaft and operable in response to the rotation of said shaft to provide an indication of change of direction of flight of said aircraft;

g. gyro compass means operatively interconnected to said shaft and operable in response to rotation of said shaft to provide an indication of change of direction of flight of said aircraft;

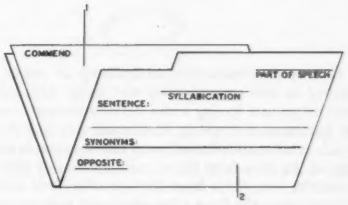
h. turn and bank indicator means including a rate of turn indicator and a bank indicator operatively interconnected to said shaft and operable upon rotation of said shaft to provide an indication of the rate of turn and degree of banking of said aircraft; and

i. rate of climb indicator means operatively interconnected to said shaft and operable in response to axial movement of said shaft to provide an indication of rate of climb of said aircraft.

3,885,326
EDUCATIONAL METHOD AND APPARATUS

Madeleine O. Robinson, 80 Chestnut Ave., Cranston, R.I. 02910, and Paul F. Burton, 14 Wolcott Ave., Andover, Mass. 01810

Substitute for Ser. No. 753,019, Aug. 13, 1968, abandoned.
This application Oct. 9, 1973, Ser. No. 404,348
Int. Cl. G09b *17/00, 1/06*
U.S. Cl. 35—35 J **3 Claims**



1. A system for vacabulary self-instruction, comprising

a. a word-bearing card color coded according to the part of speech of said word,

b. said card bearing information with respect to said word,

c. a holder for said card and bearing spaces for written student responses,

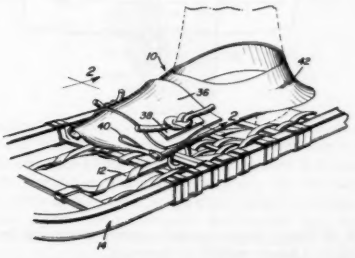
d. said holder being formed with an aperture to expose said word on said card and mask said information,

e. said holder being a transversely folded panel apertured at diagonally opposite corners and formed with a cleanable writing surface.

3,885,327
SNOWSHOE BINDER

Robert E. Maki, P.O. Box 105, Painesdale, Mich. 49955

Filed July 11, 1974, Ser. No. 487,678
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AB **8 Claims**

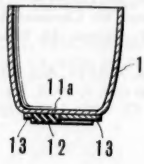


1. A snow shoe binder comprising a pannel of resilient flexible material, said panel having a forward toe portion and rear boot receiving portion, said forward portion including a pair of opposed side extensions folded downward and under the front forward portion, and a front extension folded downward and rearward under the forward portion, said rear boot receiving portion including an enlarged opening defined therethrough for the reception of the boot.

3,885,328
INFANT CHILDREN'S SHOE

Yaichiro Hirasawa, Tokyo, Japan, assignor to Fujidai Rubber Industry Company, Ltd., Japan

Filed Mar. 22, 1974, Ser. No. 453,719
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 E 5 Claims

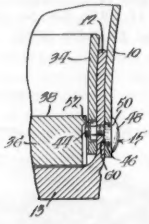


1. A shoe construction, comprising an upper, an outsole secured to said upper having rear, outer side, inner side and front edges and having a slot defined through said outsole at the heel spaced inwardly from each side and rear edge and which extends substantially one half way down the outer side edge of the shoe from the rear edge and only about one quarter of the way down from the opposite inner side edge from the rear edge, the front edge of the slot being concavely arcuate from the outer side edge to the inner side edge, and a heel of the same configuration and substantially the same size as the slot extending through the slot and having an inner portion with an interior face secured to said upper.

3,885,329
SKI BOOT WITH CANTABLE UPPER

Charles S. French, Sun Valley, Idaho, assignor to Scott USA, Sun Valley, Idaho

Filed May 15, 1974, Ser. No. 470,208
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL 21 Claims



1. A ski boot having an upper section which can be canted relative to a lower section, comprising:

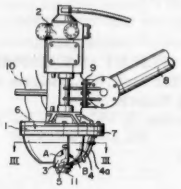
an eccentric member mounted within one of said sections and rotatable about a connecting member associated with the other of said sections, the axis of the eccentric member being offset from the axis of the connecting member, and

adjustment means for allowing rotation of the eccentric member to change the position of the one section relative to the other section and for locking said eccentric member against rotation to thereby maintain a selected cant.

3,885,330
EXCAVATOR FOR DIGGING A HOLE BENEATH THE WATER

Toshinobu Araoka, 1308-1, Orio, Yahata-ku, Kitakyushu, Japan

Filed Mar. 7, 1973, Ser. No. 339,017
Int. Cl. E02f *3/92*, *3/94*
U.S. Cl. 37—57 3 Claims

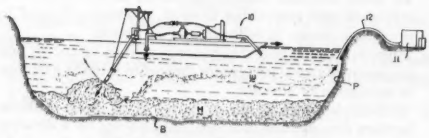


1. Apparatus for digging a hole beneath a body of water, said apparatus comprising a machine body, a cover mounted at the bottom of the body, a motor in said body connected to drive a shaft passing through the center of said cover, a circular frame having substantially the same diameter as said cover and attached to said drive shaft, said frame carrying cross bars and a screen positioned beneath said cover, metal claws mounted on said cross bars and the lower end of said drive shaft, and a suction pipe, having one end which is connected to a hole in said cover eccentrically of said drive shaft.

3,885,331
DREDGING BARGE HAVING DIGGING JETS AND STEERING JETS

Thomas A. Mathieu, 2204 Justice St., Suite A, Monroe, La. 71201

Filed June 25, 1973, Ser. No. 373,140
Int. Cl. E02f *3/92*, *5/28*
U.S. Cl. 37—63 4 Claims

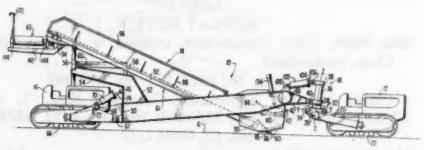


1. A barge for removing material from the bed of a pond, lake or like body of water comprising a floating hull, said hull having opposite sides and opposite ends, means for drawing water from the pond, lake or like body of water, means for forcefully returning the water to the pond, lake or like body of water at each end of said hull, the water returning means at a first end of said hull including a manifold, a plurality of tubular pipes connected to said manifold, means mounting said manifold for pivoting movement about a horizontal axis whereby ends of said tubular pipes may be positioned variably vertically relative to the material upon said bed thereby creating a material-water admixture as well as providing forwarding propulsion to said hull, means for controlling the flow of liquid to said manifold and said pair of tubular pipes, said water return means includes a pump, said hull carries an internal combustion engine for driving said pump, means for varying the angle of said first mentioned tubular pipes to the horizontal, water returning means at a second end of said hull including at least a pair of tubular pipes, said pair of tubular pipes being directed generally forwardly in the direction of forward propulsion and inclined relative to the horizontal, and means mounting said pair of tubular pipes each for pivoting movement about a vertical axis whereby said tubular pipes may be pivoted to steer the barge.

3,885,332
ELEVATING BELT LOADER AND EXCAVATION APPARATUS WITH MATERIAL FLOW CONTROL

Francis H. Holland, 32nd St. West & Hesper Rd., Billings, Mont. 59102

Filed Apr. 26, 1974, Ser. No. 464,292
Int. Cl. E02f 5/00
U.S. Cl. 37—102 13 Claims



1. In an excavation and conveying apparatus which includes a horizontal loader platform movable relative to a stationary earth formation and supported between leading and trailing prime movers with said platform having fixedly secured thereto at its leading end, a rearwardly and upwardly inclined, rectangular, excavation blade defining a horizontal cutting edge with the blade extending generally transverse to the longitudinal axis of the platform, the improvement comprising:

a first upwardly and rearwardly inclined, longitudinal endless conveyor belt mounted for rotation on said platform with its leading end underlying the trailing edge of the horizontal cutting excavation blade,

a second transverse endless conveyor belt mounted for rotation below and to the rear of the raised trailing end of the first endless conveyor belt for receiving excavated material and for transporting said material transversely to a position to one side of the platform and above an underlying haul unit,

paired booms extending forwardly of, and being mounted to said trailing prime mover for pivoting about a horizontal axis passing through the prime mover track center and being loosely coupled respectively, at their forward ends, to the sides of the platform, and

a hydraulic cylinder operatively coupled to the boom on the same side of the platform as the discharge end of the transverse endless conveyor belt, and to the same side of the platform at a point above the coupling connection of that boom to said platform,

whereby; extension of the hydraulic cylinder piston rod causes pivoting of said platform about a horizontal axis extending through the boom on the opposite side of the platform to effectively swing the discharge end of the transverse conveyor in a relatively large arc to allow the apparatus to adapt itself to haul units of varying height.

3,885,333
CANVAS STRETCHER

La Wanda M. Zachary, 111 Kevin Ln., Arlington, Tex. 76014

Filed June 5, 1974, Ser. No. 476,422
Int. Cl. D05c 1/04; D06c 3/08
U.S. Cl. 38—102.2 5 Claims

1. A canvas stretcher and frame for pictures or the like comprising:

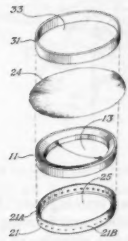
a frame member having a front edge, a rear end to be located against a wall, and a surrounding outward facing side edge,

a thin walled member having an opening corresponding in shape to the shape of said frame member and adapted to be fitted closely around the side edge of said frame member,

said frame member being adapted to have a canvas stretched over its front edge and around said thin walled member when fitted in place,

said thin walled member having a plurality of spaced bendable tangs located around its periphery and adapated to extend outward therefrom for piercing the canvas when stretched in place,

said tangs being bendable inward in the rearward directions for securing the canvas tightly around said frame, and

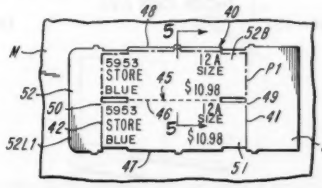


an outer member having an opoening corresponding in space to the shape of said frame member and to the shape of the thin walled member when fitted in place and adapted to be fitted closely around said outward facing side edge of said frame member and around said thin walled member when a canvas has been stretched and secured to said tangs.

3,885,334
RECORD ASSEMBLY

Paul J. Banks, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 17, 1972, Ser. No. 281,591
Int. Cl. A44c 3/00
U.S. Cl. 40—2 R 5 Claims

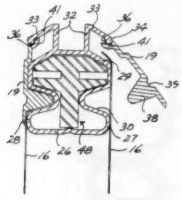


2. A record assembly, comprising: a record composed of a relatively stiff material, a pair of elongated through-cuts in the record, the one ends of the through-cuts extending to the same edge of the record, means partially severing the record between the other ends of the through-cuts, thereby dividing the record into a generally rectangular first record part and a generally U-shaped second record part, a frangible portion between the other end of at least one of the through-cuts and the partial severing means which tends to keep the first and second record parts in the same plane, the first record part being pivotal about the partial severing means and being removable from the second record part by tearing along the partial severing means, the second record part having pressure-sensitive adhesive on its underside, the first record part being free of adhesive, and backing material releasably adhered to the adhesive on the underside of the second record part.

3,885,335
SIGN HOLDING AND FRAMING ASSEMBLY

George W. Egermayer, 1417 Pine Rd., Omaha, Nebr. 68144

Filed Oct. 23, 1973, Ser. No. 408,473
Int. Cl. G09f 1/12
U.S. Cl. 40—125 G 5 Claims



1. A sign holding and framing assembly for holding at least one sign, the sign holding and framing assembly comprising:

frame means comprising a plurality of sides enclosing an open area, at least one of said sides having a pivot seat formed therein and a groove spaced inwardly from said pivot seat, said groove extending the full peripheral length of said frame means, said groove provided to receive the edge of the sign;

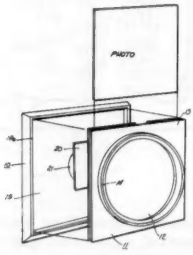
an elongated slat, said slat having a protuberance projecting laterally from adjacent one side edge of said slot, said protuberance being shaped to conform to said groove and an arcuate trough formed in the other side edge of said slot, said trough pivotally mounted on said pivot seat said slat being pivotal from an open position to a closed position wherein said protuberance seats in said groove; and

clip means releasably secured to said frame means and said slat for locking said slat in a said closed position.

3,885,336
PHOTO FRAME AND THE LIKE

Daniel H. Olsen, Toledo, Ohio, assignor to Midland Insta-Change Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 321,134, Jan. 5, 1973, abandoned. This application Nov. 5, 1973, Ser. No. 412,832
Int. Cl. G09f 1/12
U.S. Cl. 40—152 18 Claims



1. A photo frame and the like, comprising:

a. a rigid rear frame member having a flat-bottomed recess in its front face defined by an upstanding bezel,

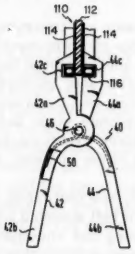
b. a rigid front frame member configured to fit loosely in said recess substantially within said bezel with a distinct peripheral clearance, for ready insertion thereinto, and removal therefrom, and having spaced front and rear faces providing a slot for the insertion of a photo therebetween, said front face having a photo aperture, and

c. cooperating permanent magnetic, and metallic elements, one secured substantially centrally of the bottom of said recess and the other secured substantially centrally of the rear surface of said front frame member, to hold said front frame member releasably within said recess, one of said elements projecting above the surface to which it is secured, whereby pressure on said front frame member adjacent an edge thereof causes said front frame member to tilt with respect to said recess to raise the opposite edge above said bezel so that it may be grasped for easy removal.

3,885,337
DISPLAY DEVICE

Max Bubb, Chur, Switzerland, assignor to Designa GmbH, Chur, Switzerland

Filed Aug. 30, 1973, Ser. No. 393,042
Claims priority, application Germany, Sept. 7, 1972, 2243973; Oct. 17, 1972, 2250888; Nov. 13, 1972, 2255491
Int. Cl. G09f 1/12
U.S. Cl. 40—152.1 9 Claims



1. A display device comprising, in combination:

a. a panel member having two major faces and a circumferential face portion connecting said major faces and extending in a continuous, convexly arcuate, closed loop; and

b. an annular frame of yieldably resilient, synthetic resin composition, said frame being of approximately C-shaped, uniform cross section and including an elongated web portion having one concave and one convex longitudinal face, two elongated flange portions projecting from said concave face in transversely spaced relationship, an elongated re-entrant portion on each flange portion remote from said web portion and directed toward the re-entrant portion on the other flange portion, and an edge portion on a part of each re-entrant portion remote from the associated flange portion, said edge portion extending from said re-entrant portion to said web portion and being integrally connected to said re-entrant and web portions, each edge portion jointly with the associated re-entrant and flange portions and with a part of said web portion bounding a longitudinally open bore in said frame, said circumferential face portion of said panel member being received between the edge portions of said frame.

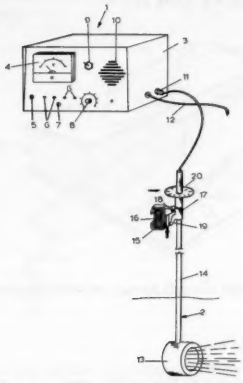
3,885,338
METHOD OF CONTROLLING THE MOVEMENT OF PELAGIC FISH AND/OR SIGNALING APPARATUS USE THEREFOR

Albert Garnett York, Wellington, New Zealand, assignor to New Zealand Inventions Development Authority, Wellington, New Zealand

Filed Nov. 6, 1972, Ser. No. 303,720
Claims priority, application New Zealand, Nov. 5, 1971, 165386
Int. Cl. A01k 79/00
U.S. Cl. 43—17.1 8 Claims

1. A signalling apparatus for selectively producing an underwater acoustic signal detectable by pelagic fish, said apparatus comprising an amplifier, multi-channel transcribable storage

means for storing information corresponding to natural signals which the fish normally associate with feeding and natural signals which the fish normally associate with danger, a transcription unit operable on said transcribable storage means to produce an input signal to said amplifier, selection means for selecting the desired stored information, and a transducer



supplied by said amplifier to emit the underwater acoustic signal which may be selected at will either to attract the fish towards the signal source by producing the natural signals which the fish normally associate with feeding or to repel the fish away from the signal source by producing the natural signals which the fish normally associate with danger.

3,885,339

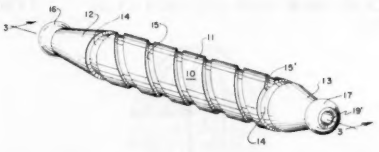
FISHING LURE BODY

Edward C. Herkner, 4407 Plum St., Boise, Idaho 83703

Filed May 11, 1973, Ser. No. 359,296

Int. Cl. A01k *85/00*

U.S. Cl. 43—42.05 **2 Claims**



1. A fishing lure body comprising a cylindrical portion, a pair of cone-like portions disposed with their bases at said terminal ends of said cylindrical portion, a spiralling groove cut into said cylindrical portion, and said body and portions being bored along the central rectilinear axis to include a wide diameter bore disposed from one end of one of said cone-like portions more than half way through said cylindrical portion and a narrower bore disposed from the end of the other cone-like portion to intersect and axially align with said wide bore portion, each of the terminal ends of said exterior cylindrical walls being provided with a transverse circumferential groove.

3,885,340

FISHING LURE

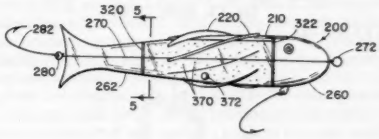
Donald C. Volenec, 4533 S. 39th St., Omaha, Nebr. 68107

Filed Nov. 5, 1973, Ser. No. 413,033

Int. Cl. A01k *85/00*

U.S. Cl. 43—42.16 **10 Claims**

1. A fishing lure comprising a closed hollow body, a fluid in said hollow body, a plurality of particles in said fluid so that when said fluid moves such movement causes said particles to move, said particles being of a highly light-reflective nature,



hook means attached to said body, said body having a fishing line attachment means on the exterior thereof.

3,885,341

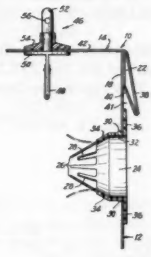
GYPSY MOTH TRAP

Morris William Kuchenbecker, and Walter John Oppermann, both of Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Mar. 28, 1974, Ser. No. 455,860

Int. Cl. A01m *1/10, 23/08*

U.S. Cl. 43—65 **8 Claims**

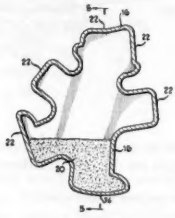


1. A trap for flying insects comprising: a housing, including a base having an upstanding sidewall with at least two apertures to the interior of said housing, said apertures being oppositely disposed on said sidewall; a one-way gate member mounted on said sidewall within each of said apertures thereof, said gate member including means for mounting on said sidewall, a generally frustoconical, inwardly tapered inner portion comprised of a multiplicity of resiliently deformable fingers projecting into said housing, and a short, generally circular wall portion coaxially positioned between said mounting means and said inner portion, said fingers permitting ready entry of insects into said housing and impeding their egress therefrom, and said circular wall portion providing a crawling surface on which such insects may conveniently alight and from which they may readily proceed through said frustoconical portion into said housing; a scent-producing attractant disposed within said housing on a path substantially between said oppositely disposed apertures, so that air currents flowing along said path may readily carry the scent of said attractant to the outside of said housing; and covering means engaged adjacent the upper end of said sidewall and substantially closing said base.

3,885,342
BALANCING TOY SET

Howard J. Morrison, Deerfield, and Donald F. Nix, Hanover Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Sept. 26, 1973, Ser. No. 400,982
Int. Cl. A63h 15/06
U.S. Cl. 46—22 7 Claims

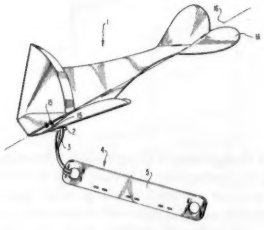


1. A balancing toy set, comprising: a plurality of substantially hollow rigid playing pieces only partially filled with fluent material so as to be shiftable within the playing pieces and, therefore, the playing pieces being capable of being stacked one on top of another in various positions and sequences by shifting the center of gravity of the playing pieces to maintain equilibrium.

3,885,343
TOY AIRPLANE OF FOLDABLE SHEET MATERIAL AND LAUNCHING MEANS FOR AND METHOD OF MAKING SAME

Irvin L. Fields, 708 Center Ave., Holly Hill, Fla. 32017

Continuation-in-part of Ser. No. 277,237, Aug. 2, 1972, Pat. No. 3,768,198. This application June 28, 1973, Ser. No. 374,327
Int. Cl. A63h 27/14
U.S. Cl. 46—79 34 Claims

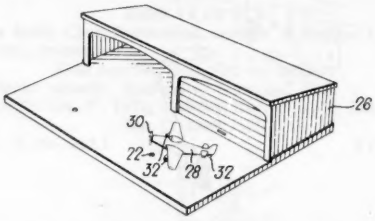


1. A toy airplane comprising: a plurality of sheets of normally flat sheet material folded into an airplane configuration having a body section and a wing section, and launch accommodating means fixedly connected with said wing and body section, both of said body section and said wing section being substantially symmetrically disposed with respect to a longitudinal airplane axis, said body section and wing section being constructed so as to fly through the air upon being released in the air above a predetermined starting velocity, wherein a first of said sheets includes a slot through which a portion of a second of said sheets protrudes in the assembled condition of the airplane, wherein said launch accommodating means is engageable with launching means for accelerating said airplane to above said predetermined starting velocity, and wherein said launch accommodating means includes a third sheet of normally flat sheet material.

3,885,344
STANDS FOR MODEL AIRCRAFT

Duncan Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong, Hong Kong

Filed Feb. 27, 1973, Ser. No. 336,206
Claims priority, application United Kingdom, May 10, 1972, 21987/72
Int. Cl. A63h 29/16
U.S. Cl. 46—44 5 Claims

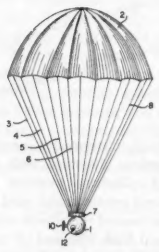


1. A stand for a model aircraft having an airscrew comprising:
a base;
a motor fixed to said base;
an air outlet in said base;
a fan drivably connected to said motor; and
a duct connecting said fan to said air outlet in said base, said outlet having dimensions such that a stream of air can be directed through said outlet against substantially only said airscrew; and
locating means on said base for so positioning said aircraft on said base that only said airscrew is positioned in said stream of air.

3,885,345
TOY PARACHUTE

Gerald O'Neill, Stratford, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 18, 1973, Ser. No. 398,224
Int. Cl. A63b 33/20
U.S. Cl. 46—86 R 3 Claims

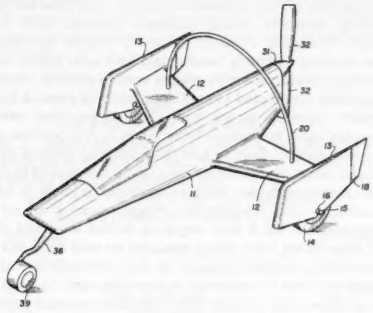


1. A toy parachute, comprising
a hollow ball;
a parachute canopy having a plurality of shroud lines affixed thereto at one end and affixed to the ball at the other end; a ring around the canopy at the open end thereof for holding the canopy closed during upward flight when the ball is thrown in the air;
a control cord affixed at one end to the ring; and
control means in the ball affixed to the other end of the control cord for drawing the control cord into the ball at a selected time after the ball is thrown into the air thereby pulling the ring off the canopy and permitting the canopy to mushroom out and float the ball to earth.

3,885,346
TOY VEHICLE

Burton C. Trattner, Hempstead, N.Y., assignor to Albert C. Nolte, Jr., Jericho, N.Y., a part interest

Continuation of Ser. No. 159,332, July 2, 1971, abandoned. This application June 11, 1973, Ser. No. 368,572
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **4 Claims**

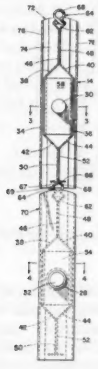


1. A toy vehicle comprising a body and ground engaging wheels, a propeller and an elastic band motor drivingly connected to said propeller, said propeller being a pusher propeller and being inclined to the horizontal to hold the front of the vehicle in a downward position, one of said ground engaging wheels being a front ground engaging wheel located forwardly of the remaining parts of the vehicle and mounted upon a pivoted strut and said elastic band motor being connected to said strut to absorb shock as said front ground engaging wheel strikes an obstacle.

3,885,347
DAMPER WIND STOP AND BLADE SEAL DESIGN

Shizuo R. Adachi, Glendale, and Robert G. O'Neal, La Puente, both of Calif., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 4, 1974, Ser. No. 430,848
Int. Cl. F24f *13/08;* **E06b** *7/08*
U.S. Cl. 49—92 **2 Claims**

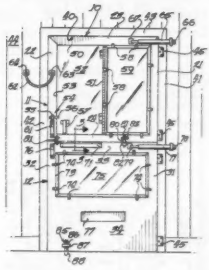


1. A damper assembly comprising: a frame including two pairs of opposed, substantially parallel frame members; a plurality of spaced-apart substantially parallel rigid blades extending longitudinally between one pair of frame members; pivot means fixed to said blades and connecting said blades to said one pair frame members for rotation of said blades about spaced parallel axes between open and closed positions, said axes being disposed in a common plane; means on said pivot means for applying torque thereto to rotate said blades; a resilient sealing member fixed to each blade at one longitudinal-extending edge thereof, said sealing member having a tubular portion extending beyond said edge, the other longitudinally-extending edge of each blade having a generally flat surface disposed substantially transversely of said common plane and adapted to be contacted by the sealing member of an adjacent blade in the closed position of said blades; said contacting portions of said sealing members and said surfaces lying in said common plane for the application of straight-line force to said blades by the pressure of said sealing members exerted on said blades thereby operatively to maintain said blades in closed position while relieving the application of torque of any substantial magnitude on said pivot means to hold said blades in closed position.

3,885,348
PROTECTIVE STORM DOOR

Edith Swearingen, 1174 Lakewood Dr., Lexington, Ky. 40502

Filed Nov. 16, 1973, Ser. No. 416,626
Int. Cl.[2] E06B *7/28*
U.S. Cl. 49—171 **7 Claims**



1. A security storm door for use in a door opening of a home and the like in a door casing provided therein defining a rectangularly shaped opening having a top horizontal casing member and opposed vertical side casing members, the storm door being of a size to fit in the door opening, the storm door comprising a door divided horizontally into a top door section and a bottom door section, the top door section including a pair of spaced apart vertically extending inner and outer side frame members which are interconnected at their opposite ends by a pair of horizontally extending top and bottom frame members, the bottom door section including a pair of spaced apart vertically extending inner and outer frame members which are interconnected by a pair of spaced apart top and bottom frame members, hinge means associated with each of the inner frame members of each of the top and bottom door sections and connected at one end to the associated frame members with the opposite ends of said hinge means each connected to the respective casing side frame of the door opening for supporting the top and bottom door sections for swinging movement in and out of the door opening about a vertical axis, means for releasably locking the top door section in the door opening closed position, means for releasably locking the bottom door section in the door opening closed position, the frame members of the top door section defining an opening, a vertically extending member extending between the top and bottom frame members of the top door section to divide the opening in the top door section into first and second opening portions, the first opening portion being of a size and configuration adapted to receive small packages and the like

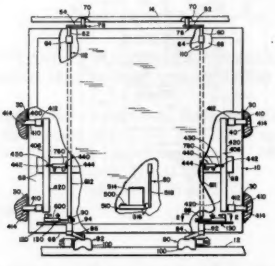
therethrough, a closure member hingedly connected along one edge to the vertically extending member for swinging movement thereabout into and out of a position closing the first opening portion, means for releasably locking the closure member in its closing position to the top door section, a removable transparent member adapted to be disposed within the second opening portion to close the second opening portion, means to removably secure the transparent member to the top door section so that the transparent member is removable without any movement of said closure member, the top door section, or the bottom door section, the transparent member being interchangeable with a screen unit of the general same size and configuration in a manner to adapt the second opening portion to climatic conditions, a shelf mounted to the top frame member of the bottom door section immediately below the first opening portion of the top door section and adapted for the resting of packages and articles thereon, and means for detachably attaching the top and bottom door sections together for simultaneous swinging movement into and out of the door opening.

3,885,349

HYDRAULICALLY CONTROLLED DOOR WITH TANDEM CRANK ARMS AND LATCHES

Robert E. Owen, 4522 Manor Circle, Sioux City, Iowa 51104

Continuation of Ser. No. 261,199, June 9, 1972, abandoned.
This application Feb. 25, 1974, Ser. No. 445,155
Int. Cl. E05d *15/10*
U.S. Cl. 49—220 **5 Claims**



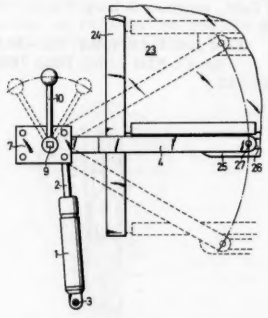
1. A laterally movable, sliding door for operation in upper and lower parallel guiding and supporting door tracks and for movement laterally into and out of a door opening and for sliding longitudinally along said tracks to a position uncovering said door opening, an actuation mechanism for laterally moving the door comprising: two generally horizontally extending upper crank arms each rotatably journalled at one end portion of each to an upper section of said door, each of said upper crank arms having an upwardly extending track engaging means at its other end portion making sliding and guiding engagement with the upper door track; at least two horizontally extending lower crank arms rotatably journalled at one end portion of each to the lower end of the door, and each lower crank arm having a downwardly depending track engaging means at its other end portion making sliding and guiding engagement with said lower door track; said upper and lower crank arms each being independently journalled by means respectively comprising upper and lower vertical shaft means to which they are respectively attached whereby said four arms and said shaft means form two upper and two lower crank arm and shaft means assemblies, said door having at least four of said crank arm and shaft means assemblies comprising right side top and bottom and left side top and bottom crank arm and shaft means assemblies, two door control hydraulic cylinder assembly means each having a first portion attached to said door and a second portion movably and reciprocally mounted on said first portion, means operably connecting said second portions of said door control hydraulic cylinder assembly means to said right and left crank arm and shaft means assemblies respectively so that movements of said second portions in said two opposite directions respectively causes door opening and closing operations respectively of said crank arm and shaft means assemblies, controllable hydraulic means attached to said door and operably connected to said door control hydraulic cylinder assembly means for selectively causing movement of said second portions in a selected one of two opposite directions, said door having door latching assembly means mounted thereon, door latching control hydraulic cylinder assembly means operating said door latching assembly means, said hydraulic means having a latching cylinder assembly means control portion which latter is operably connected to said door latching control hydraulic cylinder assembly means and which is provided with a sequencing valve in it which latter when in one position permits flow of hydraulic fluid to said door latching control hydraulic cylinder assembly means causing said latter means to be operated causing said door latching assembly to latch, at least one of said door control hydraulic cylinder assembly means having a controllable valve part engaging means mounted thereon, said sequencing valve being mounted on said door and having a controlling portion engaged by said controllable valve part engaging means to cause said sequencing valve to be in its said one position only at times when said latter second portion has reached a position reached only when said crank arm and shaft means assemblies are in door closed positions.

3,885,350

LIFTING MECHANISM FOR THE WINDOW OF A VEHICLE

Hans Scheben, Koblenz-Rubenach, Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Germany

Filed Jan. 21, 1974, Ser. No. 435,116
Claims priority, application Germany, Jan. 30, 1973, 2304335
Int. Cl. E05f *11/38*
U.S. Cl. 49—348 **13 Claims**



1. An operating mechanism for lifting a load comprising, in combination:

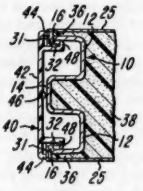
a. a support;
b. a lifting lever pivotally mounted on said support;
c. means for connecting the load to be lifted to said lever;
d. spring means operatively interposed between said support and said lever for counteracting the weight of said load, said spring means including
   1. a cylinder member,
   2. a piston assembly received in said cylinder member and projecting therefrom,
   3. a body of gas under pressure in said cylinder member and biasing said piston assembly outward of said cylinder member, and

4. blocking means for blocking relative movement of said cylinder member and of said piston assembly;
e. control means for releasing said blocking means;
f. a manual operating member movably mounted on said support; and
g. motion transmitting means operatively interposed between said lifting lever, said control means, and said operating member for actuating said control means and for transmitting motion between said operating member and said lever when said operating member is moved on said support.

3,885,351
METAL DOOR ASSEMBLY

Raymond E. Imperial; Edward G. Schultz, Jr., and George Scott Hull, all of Richmond, Ind., assignors to Johnson Sheet Metal Works Corp., Richmond, Ind.

Filed Nov. 19, 1973, Ser. No. 416,883
Int. Cl. E06b *3/16*; **E04c** *2/34*
U.S. Cl. 49—501 **12 Claims**



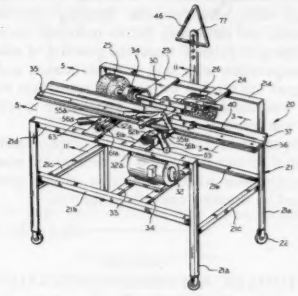
1. An improved metal door assembly comprising a rectangular-shaped metal frame including longitudinally extending parallel metal frame members each having two longitudinally extending parallel spaced channel portions integrally connected by a web portion, said channel portions of each said longitudinal frame member defining two outwardly facing longitudinally extending cavities, each of said channel portions including an inwardly and laterally projected lip portion extending generally flush with said web portion, a set of generally parallel rectangular sheet metal side panels each having outer edge portions formed inwardly and projecting into said cavities for connecting said side panels to said frame, thermal insulation material disposed within said frame between said side panels, a set of elongated trim members extending adjacent said frame members and covering said cavities, and each of said trim members includes a set of longitudinally extending hook-shaped leg portions projecting into said cavities under the corresponding said lip portions for securing said trim members to said frame and said side panels.

3,885,352
SHARPENING MACHINE

John R. Juranitch, 932 S. Layton Blvd., Milwaukee, Wis. 53215

Filed July 19, 1974, Ser. No. 490,184
Int. Cl. B24b *7/00, 9/00, 3/52, 19/00*
U.S. Cl. 51—3 **18 Claims**

1. A sharpening machine for guiding an edge of a cutting instrument uniformly across a hone to sharpen said edge comprising, a rigid frame, a plurality of power driven honing wheels mounted on said frame, instrument holding means and guide means, said instrument holding means securing said cutting instrument and coacting with said guide means, and said guide means being attached to said frame in spatial relation to said honing wheels and having a plurality of positioning means located thereon coacting with said instrument holding means to position said cutting instrument edge at a plurality of different angles of contact with said honing wheels, whereby said cutting instrument is guided across one of said honing wheels at one angle to form a relief surface thereon and is thereafter guided across another of said honing wheels

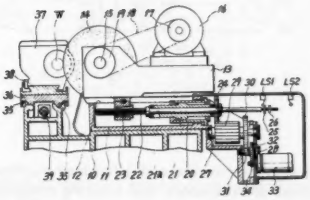


at another angle forming a finished edge at the extremity of said relief surface.

3,885,353
GRINDING MACHINE

Hiroshi Ota, Kariya, and Tetsuo Matsuzaki, Nishio, both of Japan, assignors to Toyoda-Koki Kabushiki Kaisha, Japan

Filed Oct. 29, 1973, Ser. No. 410,555
Claims priority, application Japan, Oct. 28, 1972, 47-108218
Int. Cl. B24b *51/00*
U.S. Cl. 51—5 D **11 Claims**



1. A grinding machine comprising:
a bed;
workpiece supporting means mounted on said bed;
a wheel slide slidably mounted on said bed and rotatably supporting a grinding wheel driven by a motor thereon;
a hydraulic cylinder provided on said bed and serving to rapidly move said wheel slide toward and away from a workpiece on said workpiece supporting means;
a stepping motor mounted on said bed and serving to feed said wheel slide toward and away from the workpiece for grinding the same;
dressing means mounted on said wheel slide and being movable toward and away from said grinding wheel for dressing the same;
first feed means mounted on said wheel slide for feeding said dressing means toward said grinding wheel by a predetermined dressing amount whenever a dressing operation on said grinding wheel is performed;
second feed means mounted on said wheel slide for actuating said dressing means so as to perform a dressing operation on said grinding wheel;
said stepping motor further serving to move said wheel slide toward the workpiece by a distance corresponding to said predetermined dressing amount whenever the dressing operation is performed; and

original position determination means, having shiftable means slidably supported on said wheel slide, drive means connected to said first feed means for shifting said shiftable means by a distance corresponding to said predetermined dressing amount in a direction of retraction of said wheel slide whenever the dressing operation is performed, and detecting means mounted on said bed for detecting an original retracted position of said wheel side in cooperation with said shiftable means and generating a signal for serving to stop the retraction movement of said wheel slide when said wheel slide is retracted from said workpiece,

whereby said wheel slide can be accurately positioned at the original retracted position thereof which must be varied in accordance with a reduction of said grinding wheel caused by dressing operations thereon.

3,885,354

AUTOMATIC RECIPRO FINISHING MACHINE

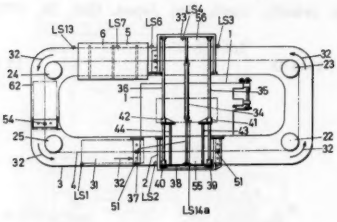
Hisamine Kobayashi, Nagoya, Japan, assignor to Shikishima Tipton Mfg. Co., Ltd., Nagoya, Japan

Filed Aug. 20, 1973, Ser. No. 389,515

Claims priority, application Japan, Dec. 20, 1972, 47-128425; Aug. 18, 1972, 47-96539; Aug. 23, 1972, 47-98219

Int. Cl. B24b *31/00, 51/00*

U.S. Cl. 51—7 **6 Claims**



1. An automatic reciprocating finishing machine for finishing surfaces of workpieces, said machine comprising:

an endless conveyor guide having two parallel passage sections;

an endless chain movably mounted around said conveyor guide;

at least two workpiece carriers for positioning thereon a workpiece, said carriers being mounted for movement about said conveyor guide;

a finishing apparatus positioned between said two parallel passage sections, said finishing apparatus including a trough filled with finishing material, said trough being vertically movable from a lower inoperative position to an upper finishing position, said means to reciprocate workpieces positioned in said finishing apparatus in a horizontal direction within said trough when said trough is in said upper finishing position;

means for automatically operatively connecting said workpiece carriers to said endless chain, whereby said workpiece carriers are moved along said conveyor guide by said endless chain, and for automatically interrupting such connection at predetermined locations about said conveyor guide; and

means for automatically transferring workpieces from one of said workpiece carriers to said finishing apparatus and from said finishing apparatus to another of said workpiece carriers at at least two of said predetermined locations about said conveyor guide.

3,885,355

PNEUMATICALLY DRIVEN GRINDER

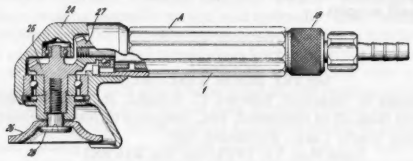
Masakazu Kakimoto, Aichi-gun, Japan, assignor to Ushio Co., Ltd., Japan

Division of Ser. No. 274,905, July 25, 1972. This application July 19, 1973, Ser. No. 380,618

Claims priority, application Japan, Feb. 19, 1972, 47-17424

Int. Cl. B24b *23/02*

U.S. Cl. 51—170 T **2 Claims**



1. A grinder driven by an air motor comprising, in combination, a tubular extrusion defining a relatively elongated tubular casing having a circular cross-section inner surface which is eccentric to the axis of said casing and which is formed with angularly spaced longitudinal grooves extending through at least a portion of the length of said casing and defining air supply and exhaust passage means; means dividing the interior of said casing into a front motor chamber having said grooves therein and a rear air supply and control chamber, a tubular motor cylinder in said motor chamber having a smooth cylindrical outer surface engaging the circular cross-section inner surface of said casing and having radial ports communicating with said air supply and exhaust passage means; an air pressure rotated cylindrical rotor rotatably mounted in said motor cylinder; a shaft projecting from the front end of said rotor for connection to a tool to be driven by said motor; said dividing means having ports connecting said supply and control chamber to said air supply passage means; exhaust port means connecting said exhaust passage means to atmosphere; a connection at the rear of said casing for connecting said air motor to a source of air under pressure, a manually operable control valve controlling communication between said connection and said supply and control chamber; the front end of said casing being externally threaded; a grinder housing threaded onto the front end of said casing; a first bevel gear secured to said shaft and disposed in said grinder housing; a second bevel gear meshing with said first bevel gear; anti-friction means rotatably mounting said second bevel gear in said grinder housing for rotation about an axis perpendicular to the axis of said first-mentioned shaft; and means securing a grinder to said second bevel gear.

3,885,356

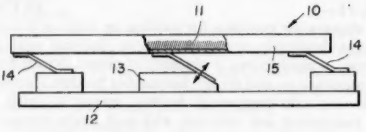
VIBRATORY CONVEYOR AND ABRADER

Jack W. Armstrong, Baldwinsville, N.Y., assignor to Lipe Rollway Corporation, Syracuse, N.Y.

Filed June 20, 1974, Ser. No. 481,124

Int. Cl. B24b *7/02*

U.S. Cl. 51—59 R **11 Claims**



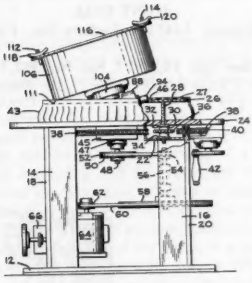
1. A vibratory conveyor and abrader comprising:

a. a support element extending along a direction of feed;

b. means for vibrating said support element in a vertical plane in said direction of feed;

c. pile material on the upper surface of said support element, said pile material having resilient bristles of uniform length inclined from the vertical, the tips of said bristles supporting objects to be fed, and said bristles flexing under said objects as said support element vibrates to move said objects in said direction of feed;
d. said pile material including resilient abrasive bristles of uniform length having particles of an abrasive material extending to said tips of said abrasive bristles; and
e. means for urging said objects into abrasive engagement with said abrasive bristles as said objects move in said direction of feed for evenly abrading said objects.

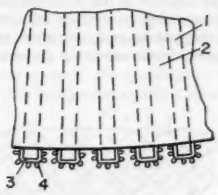
3,885,357
ORBITAL AGITATING APPARATUS
Harvey C. Hoyt, 22744 Alcalde, Cupertino, Calif. 95014
Filed Nov. 19, 1973, Ser. No. 416,752
Int. Cl. B24b *31/04*
U.S. Cl. 51—163 **13 Claims**



1. A machine for agitating an article comprising means defining a generally horizontal substantially planar nonrotatable surface, said surface defining means having an opening therein, flexible torque transmission means extending through said opening, an article supporting platform and means for attaching said platform to said torque transmission means above said surface, said attaching means including means for affording rotation of said platform relative said torque transmission means, said platform having a generally circular rim generally concentric with said rotation affording means, said flexible torque transmission means flexing to permit a peripheral region of said circular rim to bear on said surface, means below said surface for driving said torque transmission means so that said peripheral region of said circular rim describes a closed path on said surface around said opening, and means for securing the article to said platform.

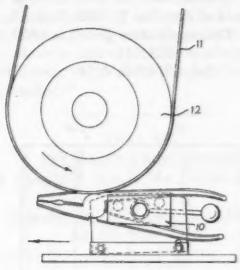
3,885,358
ABRASIVE TOOL AND METHODS OF PRODUCING SAME
Edwin Enzian, Munden, Germany, assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,538
Claims priority, application Germany, Feb. 20, 1973, 2308258
Int. Cl. B24b *5/00, 11/00;* **C08g** *51/12*
U.S. Cl. 51—206 R **20 Claims**

1. An abrasive brush tool, comprising:
a. a plurality of brush bristles;
b. an embedding mass surrounding the bases of the brush bristles, but leaving free ends of the brush bristles nonembedded; and



c. abrasive grain bonded to the free, nonembedded ends of the brush bristles.

3,885,359
HAND TOOLS
James Thomas Reekes, Cannock, and Neville Lucas Elliott, Sutton Coldfield, both of England, assignors to Elliott-Lucas Limited, Cannock, England
Filed Nov. 29, 1973, Ser. No. 420,314
Claims priority, application United Kingdom, Jan. 5, 1973, 00721/73
Int. Cl. B24b *1/00*
U.S. Cl. 51—328 **3 Claims**

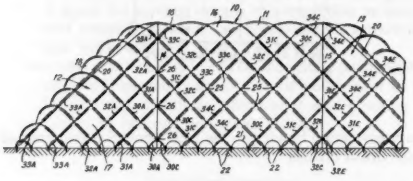


1. A method of making a hand tool of the kind comprising a pair of lever handles pivoted together and extending beyond the pivot to form a pair of jaws, comprising the steps of producing a tool each handle of which is straight over the major part of its length from a point near the free end thereof to a point near the pivot, a substantial portion of the outer side of each jaw being co-linear with the outer side of the handle which is pivoted thereto, mounting the tool in a clamp which is translatable relative to a profiling grinder, and grinding the co-linear outer portions of a jaw and handle to a uniform profile by translating the tool and the clamp, relative to the grinder, in a direction parallel to such co-linear portions.

3,885,360
REINFORCES INFLATABLE
Donato M. Fraioli, Mamaroneck, N.Y., assignor to Air-Tech Industries Inc., Clifton, N.J.
Continuation of Ser. No. 376,137, July 3, 1973, abandoned.
This application Oct. 2, 1974, Ser. No. 511,281
Int. Cl. E04b *1/345;* **E04g** *11/04*
U.S. Cl. 52—2 **10 Claims**

1. A reinforced inflatable building comprising in combination an inflatable fabric skin anchored to the ground at its periphery and adapted to be self-supporting upon filling of the interior of the building with air under pressure, a cable network overlying the outer surface of said skin including a plurality of cables lying along first and second intersecting sets of

parallel cable lines, each of said cable lines extending between peripheral ground anchors, means for rigidly clamping the intersecting cables together at the points of intersection, said cable network comprising a number of sections interconnected at connection points, and connectors provided at said connection points for interconnecting the cables in adjacent



cable sections, said sections comprising a number of cables which extend along a cable line in one of said sets through a connector at a connection point and turn to extend along a cable line in the other of said sets, each end of the cables in each of said sections terminating at ground anchors at the edge of the section positioned at the periphery of the building.

3,885,361

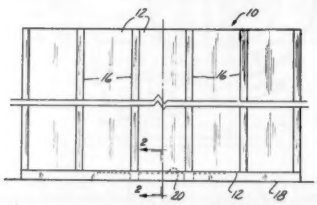
BUILDING WALL PANEL LEVELER DEVICE

Camiel R. De Schutter, St. Clair Shores, Mich., assignor to Perfect Module Systems, Inc., St. Clair Shores, Mich.

Continuation-in-part of Ser. No. 91,083, Nov. 19, 1970, Pat. No. 3,805,471. This application Dec. 11, 1972, Ser. No. 313,941

Int. Cl. E04b *2/74*

U.S. Cl. 52—122 **2 Claims**



1. A leveler device for use within a building wall panel, said leveler device comprising:

a first longitudinally disposed support plate having a lower surface thereof adapted to abut the floor on which said wall panel is disposed;

a second longitudinally disposed support plate vertically spaced above said first support plate, said second support plate having an upper surface adapted to abut a portion of said wall;

said first support plate having a spherical cavity on the upper surface thereof;

a connecting member having a spherical end permanently engaged within said spherical cavity of said first support plate forming a universal joint between said connecting member and said first support plate, said connecting member having an upper threaded section engaging a threaded aperture in said second support plate for maintaining said first and second support plates in said vertically spaced relationship, said connecting member having a multi-sided surface thereon forming a wrench engaging means for rotating said connecting member with respect to said first and second support plates while one of said support plates is restrained from rotating motion with respect to said floor such that said second support plate is raised and lowered with respect to said first support plate;

housing means having an upper wall and downwardly depending side walls the bottom surface of said upper wall being in abutment with the upper surface of said second support plate the opposing inner surfaces of said side walls being in an abutting relationship with the side surfaces of said second support plate to restrain said second support plate from relative rotational movement the longitudinal axes of said first and second support plates being disposed along the longitudinal axis of said wall panel when the same is assembled;

said housing means being disposed within said wall panel at a predetermined central location with the upper wall of said housing means having an aperture disposed at the center line of said wall panel, said threaded section of said connecting member being received in said aperture when said leveler device is disposed in said housing means to properly locate said leveler device with respect to said wall panel.

3,885,362

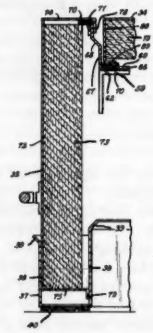
MODULAR NOISE ABATEMENT ENCLOSURE AND JOINT SEAL

Gordon J. Pollock, 24451 Lakeshore Dr., Cleveland, Ohio 44123

Filed Apr. 19, 1973, Ser. No. 352,735

Int. Cl. E04b *1/348;* **E04g** *21/10;* **E04b** *1/88*

U.S. Cl. 52—122 **25 Claims**

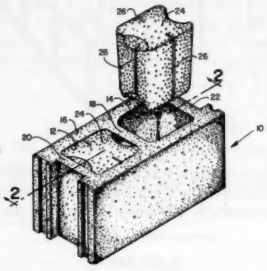


1. In a modular noise abatement enclosure, the combination of a free-standing open skeletal frame having a ground-engaging channel member with upstanding spaced legs, an upper support rail, posts interconnecting said channel member and support rail in coextensive vertically spaced relationship, height-adjusting means provided on said posts for positioning said upper support rail in a horizontal plane independently of the positional plane of said ground-engaging channel member, and a plurality of side wall panels detachably mounted in co-planar abutting relationship on each side of said frame to form a continuous enclosure, each of said panels having a sound-insulating interior face, each of said side wall panels having a lower edge slidably engaging the legs of said channel member in sealing engagement and having an upper edge detachably engaging said rail and suspended thereby to provide the sole vertical support for said panel and maintain said lower edge out of direct downward load-bearing engagement with said channel member, whereby any one of said panels can be bodily displaced and detached from said frame by relative upward movement thereof to provide interior access to a selected portion of the enclosure.

3,885,363
INSULATED BLOCK

Richard W. Whittey, Longmeadow, Mass., assignor to Korfil, Incorporated, Chicopee, Mass.

Continuation of Ser. No. 134,163, April 15, 1971, abandoned.
This application Sept. 17, 1973, Ser. No. 398,142
Int. Cl. E04b 1/88
U.S. Cl. 52—125 14 Claims



1. The combination comprising a preformed building block of concrete and a preformed insulating insert therefor, said block having an external surface and at least one cavity opening through said surface and extending downwardly a substantial distance therefrom, the cross sectional configuration and dimensions of said cavity being subject to variation within a significant range, said insulating insert being of a light weight foraminous heat insulating and fire retardant material and having an external configuration adapted to enter and substantially fit said cavity in said block, said insert configuration being such that at least a part of an upper portion of the insert adjacent said external surface of the block at a marginal wall of the cavity is disposed substantially downwardly from said surface with the insert entered in said cavity whereby to provide for downward finger access to said marginal wall, and said insert having at least one vertically extending opening so as to be cross sectionally compressible to a degree accommodating said cross sectional variation in said cavity and providing for a slight compression and sufficiently firm engagement of the insert external surface with said cavity wall irrespective of said dimensional variations whereby to frictionally retain the insert in the cavity.

3,885,364
WALL SHELL CONSTRUCTION

Jay A. Lankheet, 579 Ottawa Ave., Holland, Mich. 49423

Filed June 18, 1973, Ser. No. 370,602
Int. Cl. E04b 3/16; E02d 29/02
U.S. Cl. 52—169 7 Claims

1. A wall construction for a swimming pool, comprising:

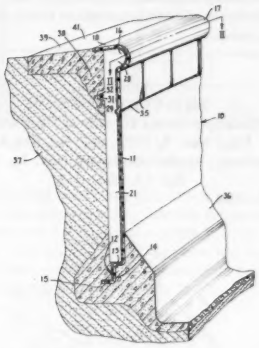
a molded plastic and fiberglass wall section having an open boxlike configuration, said wall section having an enlarged bottom panel which is normally disposed in a substantially vertical orientation, the outer surface of said bottom panel comprising the front side of said wall section;

said wall section including a coping integrally formed with and extending along the upper edge of said panel, said wall section also including an anchoring flange integral with and extending along the lower edge of said panel, said coping and said anchoring flange each projecting rearwardly of said panel;

said wall section further including a pair of end walls integral with and extending along the opposite vertical edges of said panel, said end walls projecting rearwardly from said panel and extending vertically between said coping and said anchoring flange;

a plurality of upright and substantially parallel reinforcing ribs fixedly secured to said wall section, said ribs being laterally spaced from one another and fixedly secured to the rear surface of said panel, each of said ribs being relatively narrow and occupying a relatively minor part of said rear surface;

each of said ribs having an opening extending therethrough perpendicular to the elongated length of said rib, said opening extending in a direction substantially parallel with said rear surface, the openings as formed in said plurality of ribs being substantially aligned; and

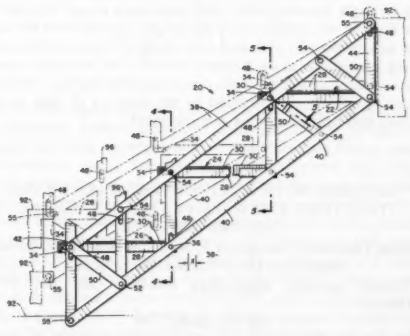


elongated rigid rod means received within said plurality of openings and extending between said plurality of ribs, said rod means being spaced rearwardly of said rear surface, whereby said rod means is adapted to be embedded within concrete or the like when said wall construction is installed.

3,885,365
SELF-ADJUSTING STAIR

Joe Warren Cox, 504 Ranch Rd., Thousand Oaks, Calif. 91360

Filed June 6, 1974, Ser. No. 476,873
Int. Cl. E04f 11/06
U.S. Cl. 52—183 12 Claims



1. A self-adjusting stair framework formed of a plurality of interconnected linkage members, said framework comprising:

a plurality of treads positionable in a substantially horizontal relationship, each of said treads having a front side and a rear side and a pair of lateral sides, each of said treads supported by a pair of tread carriers, a said tread carrier located at each said lateral side of each of said treads;

a pair of upper stringers, each said upper stringer pivotally connected to said tread carriers;

a pair of lower stringers, each said lower stringer pivotally connected to said tread carriers;

a vertical tread spacer located between and pivotally connected to each adjacent pair of said treads; and

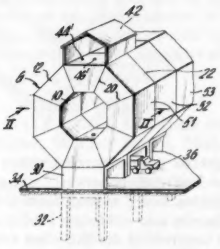
at least one longitudinal slot means formed within one of said linkage members, said slot means located at the pivotal interconnection between a pair of said members, said slot means permitting adjustment of said framework between a minimum rise adjustment position and a maximum rise adjustment position, said maximum adjustment position being displaced horizontally and vertically from said minimum adjustment position throughout the adjusting movement.

3,885,366

SILO CONSTRUCTION

Mordechai Kedar, 5 Peretz Hayuth St., Tel Aviv, Israel

Filed Nov. 9, 1973, Ser. No. 414,452
Claims priority, application Israel, Nov. 16, 1972, 40862
Int. Cl. E04h *7/22*
U.S. Cl. 52—194 **12 Claims**



1. A silo or like structure having a polygonal external shape comprising a central storage compartment and at least one annular compartment surrounding said central storage compartment and each said central storage compartment and annular compartment having a horizontal central axis; said silo being made up of at least one group of separate hollow structural units each having at least one first pair of opposed parallel sides, one second pair of opposed parallel sides and open opposed ends; said open ends extending in planes defining an angle therebetween, said units being joined together in the form of an annular array about and spaced from the central axis of the silo with said open ends of adjacent said units being contiguous to each other, whereby the first and second pairs of sides define the walls of said annular storage compartment and the space enclosed by the units of all said groups define said central storage compartment.

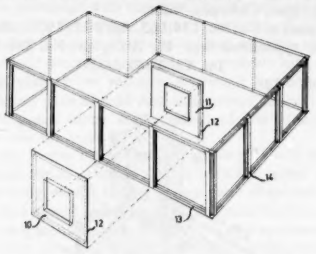
3,885,367

BUILDING WITH A SUPPORTING WALL FRAME STRUCTURE AND WALL PLATES DETACHABLY SECURED THERETO

Svante Thunberg, Slussgatan 1, S-151 36 Sodertalje, Sweden

Filed Oct. 18, 1972, Ser. No. 298,541
Claims priority, application Sweden, Oct. 21, 1971, 13370/71
Int. Cl. E04b *2/74*
U.S. Cl. 52—204 **4 Claims**

1. A supporting wall frame structure in a building, comprising a number of interconnected rectangular main frames having vertical and horizontal main frame members, a number of mutually spaced inner and outer wall panels mounted in the main frames to form inner and outer sides of a wall of a building, each frame comprising an inner and outer sub-frame located opposite each other to form a pair of sub-frames spaced from each other and interconnected by distance members to provide a free interspace between the inner and outer wall panels and sub-frames, respectively, the panels being detachably inserted from opposite sides of the respective main frame into and secured to the respective inner and outer



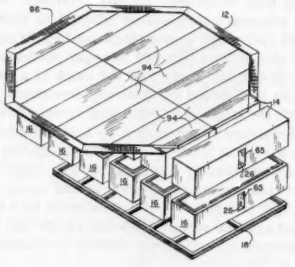
sub-frame, adjacent main frames having a common vertical frame member comprising two spaced vertical inner and outer vertical frame members to provide an opening therebetween.

3,885,368

PREFABRICATED BUILDING STRUCTURE

Merrill A. King, Arvada, and Daniel Bargas, Lakewood, both of Colo., assignors to Levingston-Armadillo, Inc., Arvada, Colo.

Filed Mar. 7, 1973, Ser. No. 338,876
Int. Cl. E04h *1/00*
U.S. Cl. 52—79 **6 Claims**



1. An offshore prefabricated building structure comprising:

a preassembled elongated rectangular base gridwork;

a plurality of modular units arranged with a plurality of upper units superimposed on and coextensive with an equal number of lower units, said lower modular units anchored directly to said base gridwork;

each modular unit containing spaced elongated side panels, spaced end panels, spaced inner panels substantially normal to said side panels and defining a hallway therebetween, a top panel interconnecting said side and end panels;

a floor panel interconnecting the side and end panels, said floor panel being vertically spaced from the lower edges of said side and end panels so as to define living quarters above the floor panel and a raceway for utilities below the floor panel, said lower and upper modular units being assembled in side-by-side relation with the side walls of adjoining said units being positively connected in flush relationship to establish a plurality of vertical reinforced supports, said upper and lower units extending transversely across the full width of said base gridwork to form an elongated assemblage of transversely extending modular units along the full length of said structure, said hallways in the upper units and in the lower units opening through the side panels and being aligned with the hallway in an adjacent unit so that a continuous hallway

through the units on each level of the structure is established; and

each said lower modular unit having guide means on the upper surface of its top panel for aligning and positioning each upper unit upon the top panel of a lower unit, said guide means comprising a raised curb extending peripherally around the upper surface of a lower unit and including a beveled surface for guiding the end and side panels of each upper unit into alignment with the end and side panels of each unit, and fastening means co-operating with said guide curbs to secure said upper units in co-extensive aligned relation to said lower units.

3,885,369

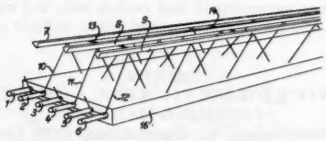
STRUCTURAL ELEMENT

Jean-Pierre Ott, Geneva, Switzerland, assignor to Etablissement Vigarex, Liechtenstein

Filed Mar. 8, 1973, Ser. No. 339,092

Int. Cl. E04c *3/20*

U.S. Cl. 52—340 **7 Claims**



1. A concrete reinforcement and supporting beam structure comprising, at least one bottom pair of metallic longitudinal members disposed parallel longitudinally and spaced laterally from each other, an upper longitudinal metallic member spaced upwardly from said pair of parallel longitudinal members parallel therewith, said upper longitudinal member being disposed in a plane intermediate the bottom pair of longitudinal members reinforcement rod configured zig-zag as triangles having upper apices substantially aligned on and joined to the upper longitudinal member with the sides of the individual triangles joined at the bottom to individual alternate ones of the bottom longitudinal members, said bottom longitudinal member's being spaced from each other a space greater than the thickness of said reinforcement rod, said reinforcement rod having continuations of the sides of said triangles extending transversely of a space between the bottom longitudinal members defining cross members joining the triangles and the bottom longitudinal members, and a prestressed slab of concrete within which said bottom longitudinal members and the transverse cross bars are embedded, said bottom longitudinal members extending axially outwardly from said concrete slab at opposite ends thereof.

3,885,370

CEILING STRUCTURE

Erkki Olli Yrjana Hirvensalo, Helsinki, Finland, assignor to Kaarina Hirvensalo, Helsinki, Finland

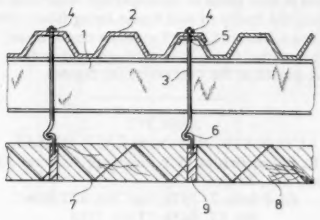
Continuation-in-part of Ser. No. 257,812, May 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 32,034, April 27, 1970, abandoned. This application Mar. 22, 1974, Ser. No. 454,014

Claims priority, application Finland, Apr. 25, 1969, 1220/69; Apr. 16, 1970, 1055/70

Int. Cl. E04b *5/52*

U.S. Cl. 52—434 **19 Claims**

1. A heat and sound-insulating ceiling structure suspended from a supporting structure, comprising a slab constituted of mineral wool boards which are heat and sound insulative and composed of fibrous material which is heat-resistant and flameproof, and means forming joints binding the boards to each other at their edges, said means consisting essentially of a heatresistant bonding agent extending substantially from the upper to the lower surfaces of adjacent boards, the bonding agent penetrating into the boards at said edges to rigidify the same and provide bending continuity of the slab at the joint, and supporting means embedded in said bonding agent, said slab being suspended from the supporting structure solely through the intermediary of said supporting means, said supporting means having upper margins which extend above the slab, and lower margins extending into the respective joints to a distance above the lower surface of the boards, said lower margins of said supporting means being covered by said bonding agent, only the bonding agent in said joints being exposed at the lower surfaces of the boards.



3,885,371

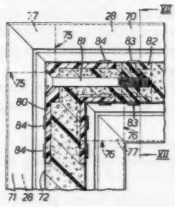
ARCHITECTURAL FRAMES

Thomas Francis Oakes, Cheltenham, England, assignor to Martin Bridgewater, Charlton Kings Cheltenham, Gloucestershire, England, a part interest

Continuation of Ser. No. 119,590, March 1, 1971, abandoned. This application July 19, 1973, Ser. No. 380,916

Int. Cl. E04c *3/30;* **F16b** *7/18*

U.S. Cl. 52—475 **5 Claims**



1. A rectangular architectural frame comprising a plurality of elongated hollow structural members rigidly connected together at their ends to provide corners for said frame, each said member being formed from two elongated thin sheet metal parts shaped to define an internal cavity having two laterally projecting flanges extending outwardly from two corners of said cavity, said two sheet metal parts being spaced from one another and being connected together by two seam joints which extend along the longitudinal edges of said sheet metal parts and which are located respectively within said flanges in spaced relation to said cavity, each said seam joint including a layer of thermal insulating material located between the adjacent edges of said two metal parts to keep said edges spaced from one another and to provide a thermal barrier therebetween, each edge of each said sheet metal part being folded over at each said seam and being indirectly interlocked with the adjacent folded edge of said other part through said layer of thermal insulating material which includes portions interleaved respectively between said folded over edges of said sheet metal parts, the extreme edges of both said sheet metal parts being concealed within said seam joints, and a completely concealed hollow L-shaped internal connecting piece at each corner of said frame, said connecting

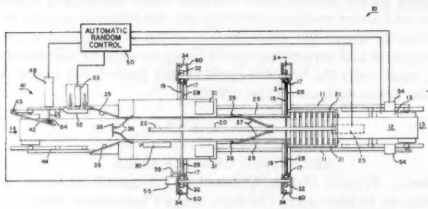
piece being fabricated of a synthetic plastic thermal insulating material and having two hollow limbs corresponding in shape to the interiors of said hollow structural members and communicating with one another, said limbs respectively fitting into and concealed within the open ends of the respective two hollow structural members at said corner, means connecting each of said hollow limbs to its respective structural member, the said internal cavity of said frame being filled with a rigid synthetic foam material which extends continuously around the interior of the frame and through said hollow internal connecting pieces at the corners of the frame.

3,885,372

AUTOMATIC RANDOM CASE SEALER

Anthony R. Peres, Bristol, N.Y., assignor to Peres Electronic Machines, Inc., Bristol, N.Y.

Filed June 7, 1974, Ser. No. 477,509
Int. Cl. B65b *57/02, 7/20*
U.S. Cl. 53—75 **10 Claims**



1. In an automatic random case sealer having devices including guide rails, flap opening and closing means, glue appliers, and means for pressing glued flaps into sealed engagement, the improvement comprising:

a. switch means in an input region of said sealer for sensing the size of each one of said cases entering said sealer;

b. brake means responsive to said switch means for stopping any one of said cases differing in size from a preceding one of said cases;

c. means responsive to said switch means for clearing said sealer of all of said cases preceding said different size case;

d. an axially movable adjusting shaft;

e. means responsive to said clearing means for positioning said shaft;

f. a vertically adjustable frame supporting said devices;

g. first cam and follower means positioned by said shaft for adjusting said frame to fit the height of said different size case;

h. a pair of horizontally adjustable members supported on said frame and carrying said glue appliers and said guide rails for said cases;

i. second cam and follower means positioned by said frame for adjusting the horizontal separation of said members to fit the width of said different size case; and

j. means responsive to said positioning of said shaft for releasing said brake means after said positioning of said shaft.

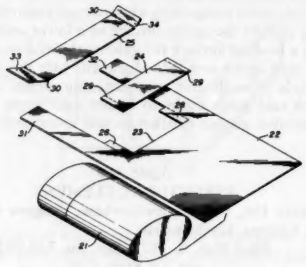
3,885,373

APPARATUS FOR SECURING ARTICLES TO A DISPLAY BOARD

Osmund V. Place, Hudson; Philip C. Hungerford, Jr., Cleveland Heights, and John L. Gereby, Wickliffe, all of Ohio, assignors to Cardpak Incorporated, Cleveland, Ohio

Filed Nov. 5, 1973, Ser. No. 412,907
Int. Cl. B65b *61/00*
U.S. Cl. 53—196 **20 Claims**

1. Apparatus for the preparation of display packages having an article secured to a card and at least one joining means for fastening said article to said card, said apparatus comprising: an endless belt carrying said articles along a predetermined path so that the operations for forming the display package



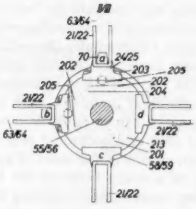
may be performed thereon, transfer means for depositing said card in juxtaposition to said article, means for periodically interrupting movement of said endless belt, and means for applying said joining means to said article and said card.

3,885,374

DEVICE FOR USE IN FOLDING A SHEET OF PACKAGING MATERIAL

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Filed Nov. 1, 1973, Ser. No. 411,875
Claims priority, application United Kingdom, Nov. 17, 1972, 53141/72
Int. Cl. B65b *11/36*
U.S. Cl. 53—234 **4 Claims**



1. A device for use in folding a sheet of packaging material comprising, in combination:

a frame,

first support means rotatably mounted on said frame to be rotatable about a predetermined axis of rotation;

two further support means extending substantially perpendicularly of one another, each said further support means being slidably mounted on said first support means and being rotatable therewith;

two pairs of elongate folder members, said folder members of each said pair being interconnected by a respective one of said further support means and being supported thereby to project radially in mutually opposite directions with respect to said axis of rotation;

stationary cam means connected to said frame to define a first camming surface encompassing said axis and a second camming surface encompassing said axis and located in spaced relationship with said first camming surface;

two roller followers, said roller followers being angularly spaced apart to define an angle of 90° therebetween at said axis of rotation, each roller follower contacting said first and second camming surfaces to follow a displacement path defined therebetween and being rotatably mounted on a respective one of said further support means to impart reciprocatory motion thereto on each

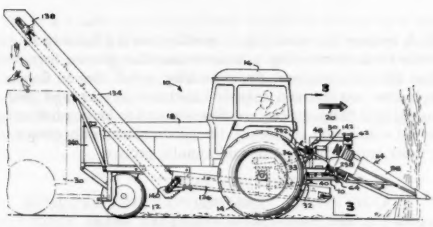
rotation of said first support means about said axis, a first portion of said roller follower displacement path describing an arc of constant radius of a first value, a second portion of said path describing an arcuate path of a radius progressively decreasing from said first value to a second value, a third portion of said path describing an arc of constant radius of said second value, and a fourth portion of said path describing an arcuate path of a radius progressively increasing from said second value to said first value, whereby each said folder member is displaced between a radially outer operative position and a radially inner inoperative position on each rotation of said first support means about said axis.

3,885,375

TRACTOR MOUNTED CORN HARVESTER

Ward W. Solterbeck, Payette, Idaho, assignor to American Fine Foods, Inc., Payette, Ind.

Filed Oct. 23, 1973, Ser. No. 408,176
Int. Cl. A01d *35/12*
U.S. Cl. 56—15.6 **20 Claims**



1. A corn harvester assembly for use on a conventional tractor being driven rearwardly with respect to its normal direction of movement and having steering wheels on one end of an engine housing, a transverse drive wheel axle housing adjacent the other end of said engine housing, a power takeoff shaft and hitch means adjacent said drive wheel axle housing at the rear portion of the tractor during its normal direction of movement, said harvester assembly comprising a supporting frame, connector means on said supporting frame dimensioned and structured for enabling connection of said supporting frame to said hitch means to be supported by said hitch means, a plurality of individual row corn harvester units mounted on said supporting frame and facing rearwardly with respect to the normal direction of operation of said tractor when said supporting frame is mounted on said hitch and power transmission means positioned to be connectable to said power takeoff shaft for providing driving power to said corn row harvester units when said supporting frame is mounted on said hitch whereby said harvester assembly can be employed for harvesting closely spaced corn rows when said tractor is operated in a direction of movement opposite its normal forward direction of movement.

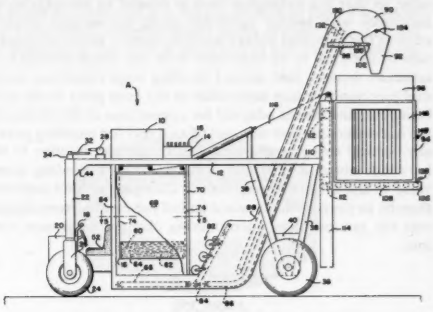
3,885,376

TOBACCO PROCESSING SYSTEM AND METHOD

William H. Johnson, Raleigh, N.C., assignor to Research Corporation, New York, N.Y.

Filed Feb. 13, 1973, Ser. No. 332,210
Int. Cl. A01d *45/16*
U.S. Cl. 56—27.5 **10 Claims**

1. A tobacco processing machine comprising a tobacco leaf defoliating means; means for transporting the defoliated leaves from said leaf defoliating means to an elevated position, first and second leaf cutters, means mounting said first and second leaf cutters in structural association with said leaf transporting means for cutting the leaves along mutually perpendicular planes as said defoliated leaves are being transported; and means for directing the cut leaves to bulk container filling means.

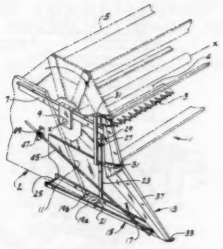


3,885,377

CROP DIVIDER FOR HARVESTER

Ralph D. Jones, Pana, Ill., assignor to Nor-Lo Engineering Co., Assumption, Ill.

Filed Mar. 8, 1974, Ser. No. 449,215
Int. Cl. A01d *63/00*
U.S. Cl. 56—314 **5 Claims**



1. A crop divider adapted for attachment to a harvester or the like for dividing crops to be harvested from crops immediately adjacent and entangled with the crops to be harvested as the harvester moves through a field so as to insure uniform feed of crop to the harvester and to prevent entanglement of the crop in the harvester, said harvester having a cutter for cutting the crop to be harvested and a reel for directing the crop toward the cutter and into the harvester, said reel being rotary about a generally horizontal axis extending transversely of the direction of travel of the harvester forward of said cutter, said divider comprising a generally vertically disposed member adapted for securement to the harvester adjacent the ends of the cutter and reel and extending forwardly of the cutter and said axis and above said axis, said member having a bottom edge adapted either to ride on the ground or to be spaced somewhat thereabove, said bottom edge extending substantially forwardly of said cutter, a first portion having a first crop dividing edge angling upwardly and rearwardly from the forward end of said bottom edge for engaging the crop to be untangled and separated and for lifting said crop as the harvester moves forwardly thereby to at least partially untangle uncut crops to be harvested from adjacent uncut crops, a second generally vertical portion positioned above said first portion having a second crop dividing edge continuous with and extending upwardly from the upper end of said first dividing edge, said first and second dividing edges meeting at a junction substantially forward of and generally at the elevation

of said axis with said second dividing edge being inclined to the horizontal at a much steeper slope than the first dividing edge so that the entangled crop is caused to abruptly move forwardly with and/or upwardly along the second dividing edge as the harvester moves forward thereby to insure separation of the crop to be harvested from the crops immediately adjacent thereto, said second dividing edge extending above said junction to insure separation of the crop prior to the crop being cut, and means adapted for connection of the divider to the harvester adjacent one end of said reel for enabling generally vertical swinging movement of the divider relative to the harvester about a generally horizontal axis extending transverse to the divider in response to changing ground contours thereby to prevent the forward end of the divider from digging into the ground upon encountering changes in ground contour.

3,885,378
FALSE TWISTING APPARATUS

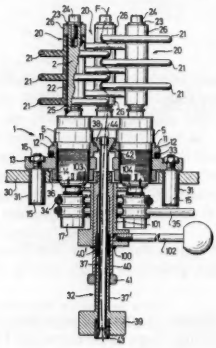
Friedrich Schuster, Hammelburg, Germany, assignor to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Filed Apr. 12, 1974, Ser. No. 460,459

Claims priority, application Germany, Apr. 16, 1973, 2319153

Int. Cl. D02g *1/04, 1/00*

U.S. Cl. 57—77.45 **10 Claims**



1. Apparatus for false-twisting threads by means of friction elements, comprising:

three spindles disposed to form the corners of an equilateral triangle in plan view;

means for rotatably mounting said spindles;

at least one rotationally symmetrical friction element on each spindle;

means for guiding thread in a path of travel past said friction elements;

said rotationally symmetrical friction elements mutually overlapping to cause thread in said path of travel to follow a zig-zag path;

means for simultaneously adjusting the position of said spindles with respect to both said path of travel of said thread and the distance between said corners of said equilateral triangle; and

means to move said mutually overlapping spindles to thereby move said friction elements into and out of mutually overlapping relationship to facilitate threading of the apparatus when said friction elements are out of mutually overlapping relationship.

3,885,379
SYSTEM FOR MOUNTING SPINDLE BEARING HOUSINGS

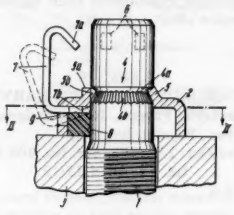
Karl Ellinger, Reichenberg, Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed Oct. 3, 1973, Ser. No. 403,332

Claims priority, application Germany, Oct. 14, 1972, 2250472

Int. Cl. D01h *7/14, 7/22*

U.S. Cl. 57—132 **8 Claims**



1. A system for mounting a spindle bearing housing to a spindle bank comprising a tapered annular groove formed within the outer surface of said housing, a bell shaped flange adapted to rest on said spindle bank and to surround said housing, said flange having a collar adapted to be beaded and inserted within said groove, said beaded collar conforming to the taper and inclination of said annular groove.

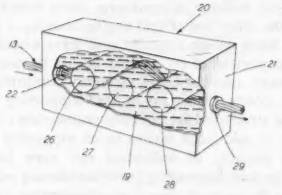
3,885,380
MANUFACTURING FILLED CABLE

Joseph Michael Hacker, Fallston, Md., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 15, 1973, Ser. No. 388,694

Int. Cl. D02g *3/36*

U.S. Cl. 57—162 **8 Claims**



1. A method of making a stranded core having the interstices thereof filled with a composition, which includes the steps of:

stranding a plurality of elongated members about a longitudinal center line to form a core, each of the elongated members having at least a predetermined yield strength; advancing the stranded core through a bath of a composition;

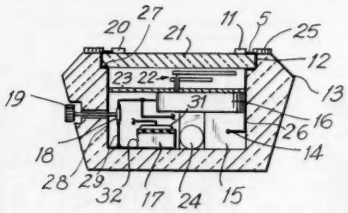
applying forces to the core to first cause the configuration of the core to be changed to expose portions of the elongated members which in the original configuration of the core are not exposed to the composition and then to permit the elongated members because of the elastic properties associated with the yield strength thereof to be reformed into a stranded core and cause the interstices between the elongated members to be filled substantially with the composition; and

removing excess composition from the reformed core to form a generally regularly shaped contour of the composition about the core.

3,885,381
BATTERY-POWERED TIMEPIECE WITH EXTERNALLY ACCESSIBLE CIRCUITRY

Masami Kasai, and Yoshio Morita, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 296,410, Oct. 10, 1972, abandoned. This application Sept. 25, 1974, Ser. No. 509,156
Claims priority, application Japan, Oct. 7, 1971, 46-79043
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 BA 10 Claims

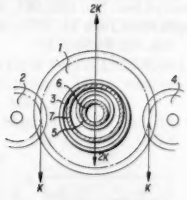


1. In a quartz-crystal oscillator timepiece driven by a battery, and having a transparent cover, the improvement comprising a plurality of adherent conductive elements on the exterior of said cover, said elements being electrically connected to the circuitry of said timepiece so that the voltage of said battery may be monitored by making contact with selected conductive elements.

3,885,382
REDUCED FRICTION WATCH CANNON SHAFTS

Max Hetzel, Bienne, and Hans Kocher, Buren, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Apr. 8, 1974, Ser. No. 458,813
Claims priority, application Switzerland, Apr. 18, 1973, 005839/73
Int. Cl. G04b *13/02*
U.S. Cl. 58—138 6 Claims



1. In a watch having at least approximately coaxial minute and hour tubes respectively which rotate with different speeds in the same direction and from which one carries the minute hand and the other the hour hand, the improvement comprising a bearing element for preventing friction between said tubes.

3,885,383
EXPANDABLE BAND

Shoichi Tanaka, No. 24, 3-chome, Tokyo, Japan

Division of Ser. No. 206,746, Dec. 10, 1971, Pat. No. 3,798,729. This application Nov. 9, 1973, Ser. No. 414,361
Claims priority, application Japan, Dec. 26, 1970, 45-119124
Int. Cl. F16g *13/24*
U.S. Cl. 59—79 R 3 Claims

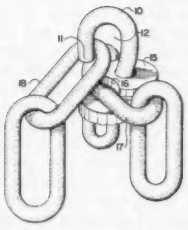
1. In an elastic, flexible band for a bracelet, wristwatch, or the like, which is capable of expanding and contracting, a single continuous wire extending along the entire length of the band and having successive portions of coiled configuration forming a plurality of successive coils which have parallel axes and which are arranged in a zig-zag pattern to form a series of outer coils which alternate with a series of inner coils, and the wire portions at the ends of each coil of one series extending

in opposite directions to the next adjacent coils of the other series, a plurality of said wires being situated with their coils coaxially arranged, and a plurality of retaining pins extending through at least some of the coaxially arranged coils for holding them together, at least some of said retaining pins being in the form of permanent magnets.

3,885,384
HOOK CONNECTOR ASSEMBLY

Roger L. Gower, Suite 302, 1911 Jefferson Davis Hwy., Arlington, Va. 22202

Filed Jan. 4, 1974, Ser. No. 430,752
Int. Cl. F16g *15/00*
U.S. Cl. 59—93 2 Claims

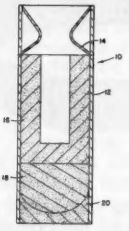


1. Apparatus for detachable connection of a link to a hook or the like comprising:
- a hook having a tip, a throat, a curved shank, and a base plate integrally connected with the shank,
- a safety ring being slidable along and rotatable about said shank,
- the curvature of said shank being such as to move said safety ring in translation away from said tip as said ring is moved along said shank away from the location of said base plate,
- said safety ring defining therein a recess at its edge,
- said safety ring in its position adjacent said base plate restricting entry of the link into the throat of the hook and permitting entry thereof only as said safety ring is moved along said shank away from base plate and concurrently is rotated about said shank to move said recess into position directly opposite said tip of said hook.

3,885,385
BASE DRAG REDUCTION

Lawrence N. Nicastro, and John R. Munger, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1972, Ser. No. 316,601
Int. Cl. F02k *9/06*
U.S. Cl. 60—250 **1 Claim**



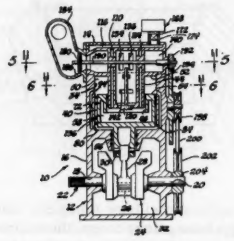
1. In combination with a solid propellant rocket motor having a propellant grain configuration selected from an end-burning grain configuration, a star-perforated grain configuration, or a cylindrical grain configuration contained within a solid propellant rocket motor case, said motor case having a head-end and an aft-end; and an exhaust nozzle affixed to said motor case at the aft-end thereof; a drag reducing propellant having a predetermined configuration positioned within said case, said drag reducing propellant having the predetermined configuration for use with said propellant grain configuration selected, said drag reducing propellant being a fuel rich, slow burning propellant that is burned a coast period of an in-flight solid propellant rocket motor to provide gases for ejecting rearward of said exhaust nozzle to relieve a partial vacuum formed by air passing by the non-streamlined surfaces of said exhaust nozzle and to thereby eliminate the base drag of said in-flight rocket motor during said coast period, said drag reducing propellant selected from the composite propellant comprised of polybutadiene acrylic acid in amounts from about 65 to about 89 percent by weight; an oxidizer selected from ammonium perchlorate and ammonium nitrate in amounts from about 10 to about 25 percent by weight; and a burning rate depressant selected from an organic or inorganic phosphate compound in amounts from about 1 to about 10 percent by weight and the cellulose base propellant comprised of cellulose acetate in amounts from about 50 to about 75 percent by weight; an inert plasticizer selected from phthalate esters, adipate esters, sebacate esters, and aryl phosphate in amounts from about 15 to about 45 percent by weight; and oxidizer-energetic plasticizer selected from nitrate esters of trihydric alcohols in amounts from about 5 to about 10 percent by weight.

3,885,386
ANNULAR PISTON ENGINE WITH AFTERBURNER AND SEPARABLE POWER TURBINE

William V. Bachmann, 22517 Ten Mile Rd., St. Clair Shores, Mich. 48080

Continuation-in-part of Ser. No. 363,247, May 23, 1973, Pat. No. 3,807,168, which is a continuation of Ser. No. 116,892, Feb. 19, 1971, abandoned. This application Apr. 22, 1974, Ser. No. 462,790
Int. Cl. F02b *37/02*
U.S. Cl. 60—307 **24 Claims**

1. An internal combustion engine, comprising engine housing means, an annular cylinder formed in said housing means, said annular cylinder comprising a first radially inner annular wall and a second radially outer annular wall, combustion chamber means communicating with said annular cylinder, ring piston means received in said annular cylinder for reciprocating movement therein, motion transmitting means operatively connected to said ring piston means for transmitting the reciprocating movement of said ring piston means to associated power output means, afterburner means situated generally radially inwardly of said first inner annular wall and in communication with the ambient atmosphere, exhaust passage means communicating between said combustion chamber means and said radially inwardly situated afterburner means, said afterburner means being effective to receive said exhaust gases from said exhaust passage means and to enable

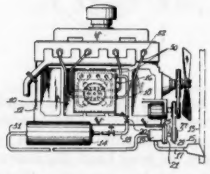


further continued combustion of said exhaust gases within said afterburner means before discharging said exhaust gases to said ambient atmosphere, and power turbine means situated generally in the path of flow of said exhaust gases so as to extract therefrom additional power as said exhaust gases flow from said afterburner means to said ambient atmosphere, said power turbine means being carried by a separable engine housing portion of said engine housing means permitting said power turbine means to be readily disassembled from said engine.

3,885,387
AIR DRIVE ADAPTOR

Garnet J. Simington, General Delivery, Lethbridge, Alberta, Canada

Continuation-in-part of Ser. No. 182,387, Sept. 21, 1971, abandoned. This application June 22, 1973, Ser. No. 372,559
Int. Cl. F15b *1/20*
U.S. Cl. 60—370 **3 Claims**



1. Apparatus removably adaptable to an internal combustion engine having at least one cylinder containing a piston reciprocable therein, an intake valve, an exhaust valve and a hole for reception of a spark plug, said apparatus comprising a source of compressed, non-combustible gas, valving means including a manifold and at least one gas distribution valve, said gas distribution valve being connected to said cylinder at said hole and to said manifold, said manifold also being connected to said source of compressed gas, and valve actuation means connected to said gas distribution valve, said gas distribution valve upon actuation by said valve actuation means permitting introduction of said compressed gas through said spark plug hole from said manifold into said cylinder when

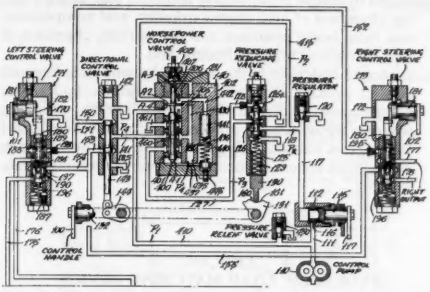
said intake and exhaust valves are closed and said piston is in a position to provide a power stroke in said engine.

3,885,388

CONTROL FOR A HYDROSTATIC TRANSMISSION

Stanley W. Crull, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 13, 1974, Ser. No. 442,191
Int. Cl. F16h *39/46*
U.S. Cl. 60—444 **12 Claims**



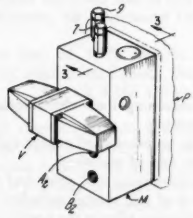
1. A control for a hydrostatic transmission having a pump, a motor, a charge pump drivable by a prime mover and a displacement control associated with one of the pump and motor and including means subjected to a control pressure for setting the transmission speed, a circuit for establishing the control pressure of a control hydraulic fluid including a control pump drivable by the prime mover and with a pressure output corresponding to the speed of the prime mover, and means for modifying the operation of the hydrostatic transmission in response to load imposed on the prime mover to maintain the prime mover at nearly constant speed including a valve in said circuit positionable in response to the pressure output of the control pump for controlling the value of the control pressure uniformly regardless of uncontrollable variables such as viscosity and temperature of the hydraulic fluid.

3,885,389

MANIFOLD WITH INTERNAL FILTER

James S. Hull, Waterford, Mich., assignor to Melvin Corporation, Bay City, Mich.

Filed Sept. 26, 1973, Ser. No. 400,784
Int. Cl. F15b *15/18*
U.S. Cl. 60—453 **4 Claims**



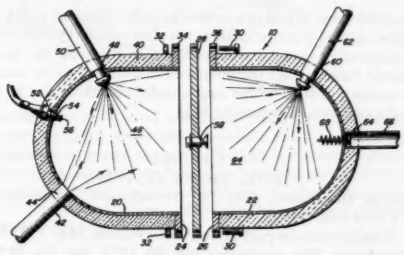
1. A manifold assembly for connecting a hydraulic pump with a hydraulic actuator for driving the same in one direction or the other as determined by a four way valve, said manifold having a first set of ports adapted to be connected to the pump for receiving fluid under pressure from the pump and returning fluid to the pump, a second set of ports adapted to be connected to the actuator to direct fluid under pressure to the actuator and receive fluid from the actuator, first and second sets of valve ports adapted to be connected to the four-way valve, a plurality of passages in the manifold for connecting the first set of ports with the first pair of valve ports and for connecting the second set of ports with the second pair of valve ports, a bore in said manifold interposed in one of the plurality of passages connecting the four-way valve with one of the first set of ports so as to return fluid to the pump, and a removable filter cartridge in said bore located so as to filter fluid flowing from said four-way valve to pump.

3,885,390

INTERNAL COMBUSTION AND STEAM PRESSURE GENERATOR WITH POWERED EXPANSION ENGINE

Glen R. Evans, Rt. 1, Box 145, Isanti, Minn. 55040

Filed Feb. 12, 1974, Ser. No. 441,841
Int. Cl. F03g *7/06*
U.S. Cl. 60—531 **5 Claims**



1. A pressure generator comprising a closed bulbous pressure vessel including an internal transverse partition dividing the interior of the vessel into at least first and second chambers, first pump driven supply means for pumping air and fluid fuel, under pressure, into said first chamber, said generator including restricted flow passage means communicating said first and second chambers, said generator further including second pump driven supply means for injecting a spray of vaporizable liquid under pressure into said second chamber for substantially flashing into gas upon being subject to the heat of combustion gases entering said second chamber from said first chamber through said passage means, gas pressure outlet means opening outwardly from the second chamber of said vessel for discharging gas under pressure from said generator, said pressure vessel including a pair of vessel end sections having closed remote ends and open adjacent ends opening toward each other, said partition including outer peripheral edges clamped between and sealed relative to the open ends of said vessel sections and said passage means defining a passage through a central portion of said partition, said pressure vessel further including ignition means operatively associated with the interior of said first chamber for at least initiating the combustion of a combustible mixture therein, and pressure controlling valve means operatively associated with said steam pressure outlet operative to maintain at least a minimum pressure within said second chamber.

3,885,391

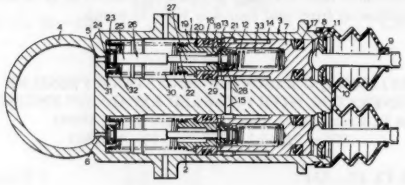
HYDRAULIC BRAKING SYSTEM

Roy Campbell, Lickey Rock near Bromsgrove, and Anthony George Price, Birmingham, both of England, assignors to Girling Limited, Brimingham, England

Filed June 25, 1973, Ser. No. 372,957
Claims priority, application United Kingdom, July 7, 1972, 31847/72
Int. Cl. F15b *7/08*
U.S. Cl. 60—581 **11 Claims**

1. An hydraulic master cylinder assembly for a vehicle braking system comprising first and second separate master cylinders, each comprising a piston adapted to work in a bore, a pressure space in said bore in front of said piston, means

defining a transfer chamber, and a transfer valve which is normally closed and which is opened by movement of said piston in a direction to pressurise hydraulic fluid in said pressure space, wherein said transfer chambers are connected by a transfer passage and at least one of said master cylinders incorporates pressure relief means defining, at least when said



transfer valve of said one master cylinder is closed, a leak path between said transfer chamber of that master cylinder and a recuperation port for connection to a reservoir for fluid to permit fluid seepage therebetween to compensate for increase in volume of fluid within said transfer chambers due to thermal expansion of hydraulic fluid.

3,885,392

DUAL BRAKE SYSTEM

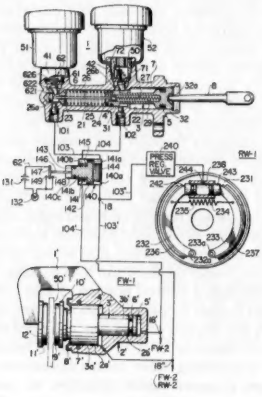
Tetsuo Haraikawa, 5-44-26, Narashinodai, Funabashi-shi, Chiba-ken, Japan

Continuation-in-part of Ser. No. 141,316, May 7, 1971, abandoned. This application July 30, 1973, Ser. No. 383,645

Claims priority, application Japan, May 9, 1970, 45-39456; May 26, 1970, 45-45063

Int. Cl. F15b *7/08*

U.S. Cl. 60—581 **3 Claims**



1. A dual hydraulic brake system for a powered vehicle having two front wheels and two rear wheels, said system comprising first and second mutually independent hydraulic brake systems operable by a single manual braking means, said system comprising:

a master cylinder having a stepped bore defining a larger diameter bore portion and a smaller diameter bore portion and a stepped piston slidably mounted in said bore defining mutually and hydraulically independent larger and smaller working chambers within the stepped bore having a relative cross-sectional ratio of 1: 1.6 – 1:2.2;

a pressure compensator having a stepped bore defining a larger diameter bore portion and a smaller diameter bore portion and a stepped piston normally resiliently balanced and slidably mounted in said stepped bore defining mutually and hydraulically independent larger and smaller working chambers having different effective cross-sectional areas, the relative ratio therebetween being 1 : 1.2 – 1:1.6;

a front wheel brake cylinder for each of said front wheels, having mutually and hydraulically independent larger and smaller working chambers, the relative ratio between their effective cross-sectional areas being 1 : 1.4 – 1 : 2;

a rear wheel brake cylinder for each of said rear wheels, having a sole working chamber;

said first hydraulic brake system including said larger working chambers of said master cylinder, said compensator and front brake cylinders and the working chambers of said rear wheel brake cylinders; and

said second hydraulic brake system element including said smaller working chambers of said master cylinder, said compensator and said front wheel brake cylinders, whereby the working hydraulic pressure prevailing in said first system element being lower than that prevailing in said second system element under normal braking conditions.

3,885,393

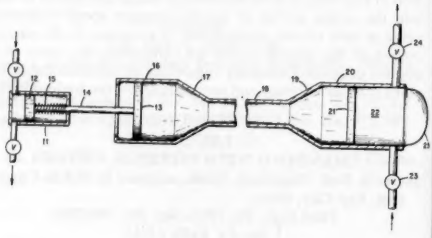
HYDRAULIC LOAD MATCHING DEVICE

John P. Hanson, McKeesport, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 7, 1973, Ser. No. 395,219

Int. Cl. F15b *7/00*

U.S. Cl. 60—583 **3 Claims**



1. A device for matching load characteristics to engine characteristics comprising:

an input shaft from an associated engine cylinder;

a first piston at the end of said shaft;

a master cylinder containing said shaft and said piston;

a nozzle at one end of said master cylinder;

a cylindrical transmission tube at the converging end of said nozzle;

a conical diffuser at the opposite end of said transmission tube;

a slave cylinder connected to said diffuser at the divergent end of said diffuser;

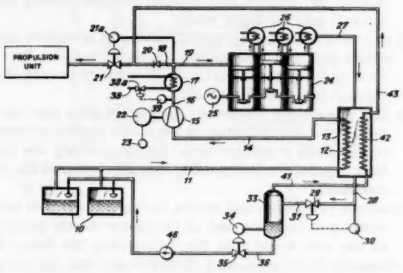
a second piston contained within said slave cylinder; and

an incompressible fluid contained within said master cylinder, said nozzle, said transmission tube, said diffuser, and said slave cylinder for transmission of motion between said first piston and second piston.

3,885,394
PROCESS AND APPARATUS FOR TREATING AND UTILIZING VAPORIZED GAS IN A SHIP FOR TRANSPORTING LIQUIFIED GAS

Karel Witt, Volketswil, and Christian Trepp, Winterthur, both of Switzerland, assignors to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Dec. 10, 1973, Ser. No. 423,122
Claims priority, application Switzerland, Dec. 11, 1972, 17958/72
Int. Cl. F01k *25/08*
U.S. Cl. 60—651 **9 Claims**



1. A process of treating and utilizing vaporized gas from a liquified gas tank of a ship for transporting liquified combustible gas comprising the steps of

drawing off a flow of vaporized gas from at least one gas tank;

compressing said flow of vaporized gas;

dividing the compressed flow of gas into at least two component flows;

feeding one of said gas component flows to a propulsion unit of the ship;

compressing a second of said gas component flows;

passing said compressed second gas component flow into heat exchange relation with a continued flow of said flow of vaporized gas to heat said continued flow of vaporized gas prior to compressing of said continued flow of vaporized gas; and

thereafter reducing the pressure of said second gas component flow and feeding a liquid part of the reduced pressure gas component flow to at least one gas tank.

3,885,395
UNDERGROUND MINING ARCH GATEWAY SYSTEM

Jens Hilligso Madsen, 60 Brentwood Dr., Guelph, Ontario, Canada

Filed Mar. 26, 1973, Ser. No. 344,926
Claims priority, application Canada, Dec. 29, 1972, 161720
Int. Cl. E21d *19/00*
U.S. Cl. 61—45 R **10 Claims**

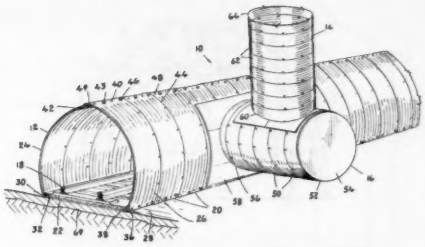
1. A gangway system manually erectable within confined underground openings excavated during backfill mining to provide a horizontal network for the progressive excavation of ore, comprising a plurality of interconnected elongated horizontal portions erectable underground in a confined space in communication with a plurality of first and second vertical portions, said horizontal portion being formed of a plurality of over-lappingly connected arch shaped sections comprising:

a. a flat corrugated steel base member having first and second ends and adapted to support mine cars on tracks,

b. a first corrugated steel curved wall member having upper and lower ends, said lower end adapted to be securely connected to said first end of said base member, and

c. a second corrugated steel curved wall member having upper and lower ends, said lower end adapted to first be securely connected to said second end of said base member, said upper end adapted to then be securely connected to said upper end of said first wall member,

said horizontal portions being adapted to be buried in a first layer of backfill after erection with said vertical portions projecting upward therefrom through said first layer of

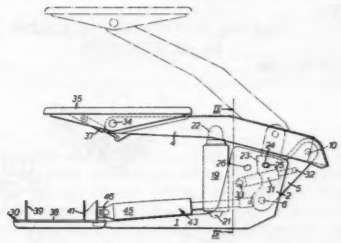


backfill to an upward horizontal ore layer, said vertical portions being upwardly extendible to project through successive upward horizontal backfill layers to successive upward horizontal ore layers, said vertical portions being spaced to provide access to said successive ore layers and for economical removal of ore downwardly therethrough to said horizontal network.

3,885,396
MINE ROOF SUPPORTS

Eric McIvor Snowden, and John Hirst Walker, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Gloucestershire, England

Filed Apr. 23, 1973, Ser. No. 354,159
Claims priority, application United Kingdom, Apr. 27, 1972, 19505/72
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 D **6 Claims**

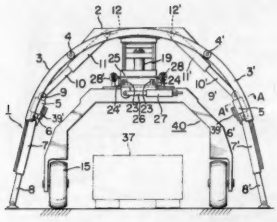


1. A mine roof support comprising a floor beam, a roof lever, a link pivotally secured to the floor beam and pivotally secured to the roof lever, the pivot axes being parallel and spaced apart the one from the other along the link, a variable length strut such as a hydraulic jack engaging pivotally between the floor beam and the roof lever at positions spaced from the link to vary the inclination of the roof lever relative to the floor beam over an angular range whereby to vary the spacing between the free ends of the beam and the lever remote from the link, and locking means capable of fixing the link mechanically in anyone of at least two alternative positions relative to the floor beam providing alternative mechanically fixed positions for the roof lever pivot axis.

3,885,397
MINING SHIELD-SUPPORTER

Masao Fujimori, Tokyo, Japan, assignor to Taiheiyo Coal Mining Co., Ltd., Japan

Filed Nov. 23, 1973, Ser. No. 418,766
Int. Cl. E21d 15/02, 15/58
U.S. Cl. 61—45 R 1 Claim



1. A shield supporter for a mining tunnel for use in the cutting of a workface in a tunnel said shield supporter comprising:

a. a central semi-ellipse member (2) with connecting ends;

b. side semi-ellipse members (3) with inner walls connected by coupling members to said opposite connecting ends of said central semi-ellipse member;

c. sliding blocks (5) with upper and lower ends mounted on inner wall of each side semi-ellipse member and adapted to slide freely;

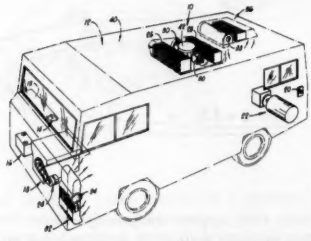
d. shifter including cylinders (11) and piston rods (10) each having one end journaled on an upper end of each sliding block and the other end journaled on the said central semi-ellipse member; and,

e. lower cylinders and rods (7, 8) having one end journaled on the lower end of each of said sliding block, and adapted to be vertically movable.

3,885,398
AIR CONDITIONING SYSTEM FOR A MOTOR HOME VEHICLE OR THE LIKE

Claude W. Dawkins, 4900 N.W. 30 St., Oklahoma City, Okla. 73122

Filed Dec. 10, 1973, Ser. No. 423,280
Int. Cl. F25d 17/06
U.S. Cl. 62—89 11 Claims



1. A refrigeration type air conditioning assembly employing a heat transfer medium for use in a motor home vehicle or the like having a front passenger area and a rear living area, and which is equipped with an engine, a source of d-c voltage, and an electrical outlet for connecting the motor vehicle or the like to a source of a-c line voltage, comprising:

a first compressor means, having a suction port and a discharge port, for compressing the gaseous heat transfer medium passing therethrough;

means for drivingly connecting said first compressor to the engine of the vehicle;

a second compressor means having a suction port and a discharge port, for compressing the gaseous heat transfer medium passing therethrough;

an electric drive motor drivingly connected to said second compressor and mounted on the vehicle;

electrical conductor means connected to said electric drive motor for electrically connecting said electric drive motor to the electrical outlet of the motor vehicle to provide a-c line voltage to said electric drive motor;

a first condenser coil means, having an inlet port and an outlet port and mounted on the motor vehicle, for condensing the gaseous heat transfer medium passing therethrough into the liquid state;

a second condenser coil means, having an inlet port and an outlet port and mounted on the motor vehicle, for condensing the gaseous heat transfer medium passing therethrough into the liquid state;

a first evaporator coil means, having an inlet port and an outlet port and mounted on the motor vehicle proximate to the front passenger area, for evaporating the liquid heat transfer medium passing therethrough into the gaseous state;

a second evaporator coil means, having an inlet port and an outlet port and mounted on the motor vehicle proximate to the rear living area, for evaporating the liquid heat transfer medium passing therethrough into the gaseous state;

first discharge conduit means interconnecting the discharge port of said first compressor means and the inlet ports of said first and second condensor coil means, for conducting gaseous heat transfer medium from said first compressor means to said first and second condensor coil means;

second discharge conduit means interconnecting the discharge port of said second compressor means and the inlet ports of said first and second condensor coil means for conducting gaseous heat transfer medium from said second compressor means to said first and second condensor coil means;

first liquid conduit means interconnecting the outlet port of said first condensor coil means and the inlet port of said first evaporator coil means for conducting liquid heat transfer medium from said first condensor coil means to said first evaporator coil means;

second liquid conduit means interconnecting the outlet port of said second condensor coil means and the inlet port of said second evaporator coil means for conducting liquid heat transfer medium from said second condensor coil means to said second evaporator coil means;

first suction conduit means interconnecting the outlet port of said first evaporator coil means and the suction port of said first compressor means for conducting gaseous heat transfer medium from said first evaporator coil means to said first compressor means;

second suction conduit means interconnecting the outlet port of said second evaporator coil means and the suction port of said second compressor means for conducting gaseous heat transfer medium from said second evaporator coil means to said second compressor means;

third suction conduit means interconnecting the outlet ports of said first and second evaporator coil means;

first blower means disposed adjacent to said first evaporator coil means for moving air over said first evaporator coil means and into the front passenger area; and

second blower means disposed adjacent to said first evaporator coil means for moving air over said second evaporator coil means and into the rear living area;

air circulating means mounted on the vehicle for moving air over said first and second condensor coil means;

a first expansion valve means connected to said first liquid conduit means and disposed adjacent to the inlet port of said first evaporator coil means; and

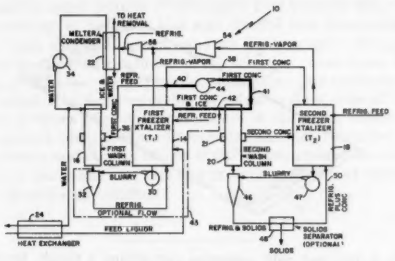
a second expansion valve means connected to said second

liquid conduit means and disposed adjacent to the inlet port of said second evaporator coil means.

3,885,399
MEANS FOR AND METHOD OF PURIFYING CONTAMINATED WATER

Robert J. Campbell, Salem, N.H.

Filed Mar. 27, 1973, Ser. No. 345,427
Int. Cl. B01d 9/04
U.S. Cl. 62—123 **13 Claims**



1. An apparatus for purifying contaminated water by freeze crystallization comprising:

a. a first stage including a first freezer-crystallizer and wash column subassembly for treating contaminated water and producing a first concentrate;

b. a second freezer-crystallizer and wash column subassembly for treating said first concentrate and producing pure ice crystals and a second concentrate in the second wash column, said second freezer-crystallizer being coupled to said first wash column to receive first concentrate, and to said second wash column to receive second concentrate, said second wash column being coupled to said first wash column for receiving and utilizing said first concentrate to wash said ice crystals in said second wash column to form a mixture of first concentrate and ice crystals; and

c. means for returning at least a portion of said mixture of ice crystals and first concentrate from said second wash column to said first stage.

3,885,400
SENSING ARRANGEMENT FOR ICE MAKER

William M. Webb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

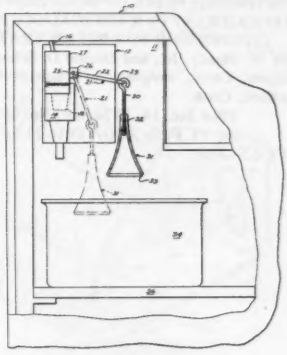
Filed Nov. 20, 1973, Ser. No. 417,584
Int. Cl. F25c 5/18
U.S. Cl. 62—137 **4 Claims**

1. In an ice maker having an ice mold in which ice pieces are formed and from which the ice pieces are ejected during a harvesting cycle and a receptacle to receive the ejected ice pieces and disposed beneath the ice mold, the improvement comprising:

a member rotatable from a first position to a second position during an ice harvesting cycle and from the second position to the first position after the ice pieces are received in the receptacle;

a second member pivotally supported on said first member and including a hollow and bell-shaped sensing element having an enlarged lower annular end forming the ice engaging surface of said sensing element;

said pivotally supported member and said sensing element having a combined fixed length to enable said ice engaging surface of said sensing element to engage ice pieces at a predetermined level when said first member is above its first position and to cause said ice engaging surface of said sensing element to be disposed above said level when said first member is in its second position, said ice engaging surface of said sensing element being adapted to overlie at least one of the ice pieces when the ice pieces in the receptacle are at the predetermined level to prevent return of said first member to its first position to stop the supply of ice pieces from the ice maker to the receptacle; and

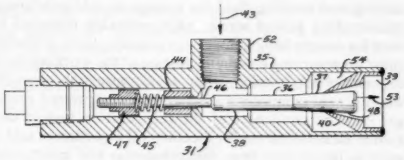


means to vary the position of said sensing element on said pivotally supported member to adjust the combined operative length of said pivotally supported member and said sensing element.

3,885,401
REFRIGERATING APPARATUS

Ronald A. Banike, Orland Park, Ill., assignor to Hollymatic Corporation, Park Forest, Ill.

Continuation-in-part of Ser. No. 293,408, Sept. 29, 1972, Pat. No. 3,848,624. This application Feb. 27, 1974, Ser. No. 446,324
Int. Cl. F28g 1/08
U.S. Cl. 62—303 **21 Claims**



11. Apparatus for refrigerating articles, comprising: means defining a thermally isolated chamber having an entrance and an exit for passage of said articles through said chamber; means for passing said articles through said chamber; means for introducing a fluid refrigerant including flowable vaporizable solid particles and gaseous fluid into contact with said articles at an intermediate section of said chamber between said entrance and exit during said passage, said means for introducing comprising guide means spanning substantially the full width of said passage of said articles for providing a plurality of flow paths distributing said fluid substantially uniformly through said width; and a self-cleaning valve in said flow path for a liquid refrigerant that also exists as a solid comprising a valve movable part having a valve closing surface, an annular valve seat part having a seal surface sealingly engaging said closing surface, one of said surfaces comprising a scraping portion engaging the other said surface, and means for moving said movable part relative to said seat part for simultaneously opening and closing said valve and scraping solid refrigerant from the other said surface with said scraping portion, said movable part being movable in one direction for

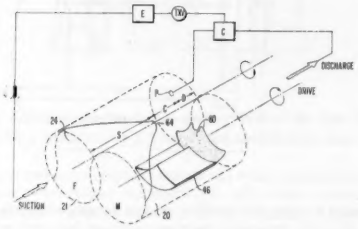
said opening and the seat part being annularly arranged around the movable part and extending in the opposite direction, said seat part comprising a knife edged scraping portion.

3,885,402

OPTIMIZED POINT OF INJECTION OF LIQUID REFRIGERANT IN A HELICAL SCREW ROTARY COMPRESSOR FOR REFRIGERATION USE

Harold W. Moody, Jr., and Donald D. Schaefer, both of Farmington, Conn., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jan. 14, 1974, Ser. No. 433,418
Int. Cl. F25b *31/00*; F01c *21/06*, *1/16*
U.S. Cl. 62—505 4 Claims



1. A method of determining the optimum point of injection of liquid refrigerant into a compressor working space of a helical screw rotary compressor forming a component of a refrigeration system including a condenser coupled to the discharge side of said compressor, and wherein said compressor includes a housing forming a working space comprising two intersecting bores, a suction port at one end of said housing opening to said space for admitting gaseous refrigerant as the compressor working fluid thereto and a discharge port within said housing opening to said space for discharging compressed working fluid for passage to said condenser, two intermeshing helical screw rotors rotatably mounted in said bore for determining compressor capacity and a shiftable slide valve for returning a variable portion of the working fluid back to compressor suction prior to compression thereof, and wherein said compressor discharges a compressed refrigerant gas into the condenser of the refrigeration system and said system includes means for bleeding off a portion of said refrigerant in liquid form from said condenser and injects said bled liquid refrigerant via an injection port into one of said bores for cooling the gaseous working fluid during compression thereof, said method comprising the steps of:

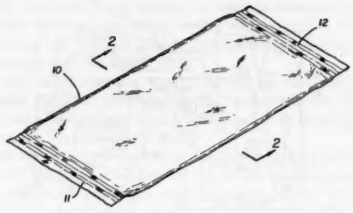
1. determining the minimum built-in volume ratio of the compressor;
2. determining within which bore injection is to take place;
3. determining the minimum operating compression ratio and maximum operating compression ratio of the compressor;
4. determining the pressure versus wrap angle plot for the rotor of the compressor both selected from step (2);
5. superimposing the determined parameters from step (1) and step (3) on the plot of step (4); and
6. ascertaining from the plot of step (5) subsequent to step (4) an acceptable injection point for said injection port in terms of wrap angle from suction of the screw rotor for the bore as determined from step (2) which results in continuous injection of liquid refrigerant within said working space regardless of undercompression or overcompression of the working fluid and the position of the slide valve within the limits of the parameters determined by steps (1), (2) and (3), without significantly compromising compressor efficiency.

3,885,403

DEVICE FOR USE AS A HOT AND COLD COMPRESS

Jacob J. Spencer, Woodbury, N.Y., assignor to Nortech Laboratories, Inc., North Bellmore, N.Y.

Continuation-in-part of Ser. No. 164,368, July 20, 1971, Pat. No. 3,780,537. This application Aug. 16, 1973, Ser. No. 388,865The portion of the term of this patent subsequent to Dec. 25, 1990, has been disclaimed.
Int. Cl. F25d *3/08*
U.S. Cl. 62—530 10 Claims



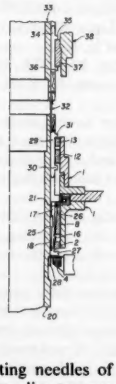
1. A hot and cold compress comprising a tough, flexible, sealed envelope and a neutral gel within said envelope, said gel being comprised of a mixture of water, a freezing point depressant selected from the group consisting of glycerine, propylene glycol and mixtures thereof and a thickening agent, the relative proportions of the water to the freezing point depressant by weight being about 1:1 to about 7:3, said gel maintaining its gel-like consistency over a temperature range of about 0° to about 212°F.

3,885,404

APPARATUS FOR PATTERNING KNITTING MACHINES

Pavel Zahradka, Trebic; Jiri Hrabanek, Nova Ves, and Milan Petranek, Starec u Trebice, all of Czechoslovakia, assignors to ELITEX, Zavody textilniho strojirenstvi, generalni reditelstvi, Liberec, Czechoslovakia

Filed June 16, 1972, Ser. No. 263,650
Claims priority, application Czechoslovakia, June 21, 1971, 4576-71
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R 5 Claims



1. Apparatus for selecting needles of a circular knitting machine for patterning according to a predetermined patterning program, said knitting machine including at least one rotatable needle cylinder provided with circumferentially spaced axially parallel longitudinal grooves in which are located said needles and control means slidable within said grooves and adapted to effect movement of said needles ac-

cording to said patterning program at a predetermined selection point, said selecting apparatus comprising a control means in each of said grooves having separate upper and lower parts, said upper and lower parts being independently slidable axially within the associated groove with respect to each other and capable of limited pivotal movement within said groove with respect to each other about an intermediate portion of each of said parts, at least one of the parts of said control means being provided with a control butt adapted to be actuated by a cam system radially spaced about said needle cylinder to axially raise said one part, spring means pivotally urging the upper portion of said upper part towards said needle cylinder to normally bias said control butt into engagement with said cam system, and an electromagnet arranged adjacent the needle cylinder at the selection point below the level of the lower part of said control means said electromagnet being selectively operable to retain certain ones of the lower portions of said control means in the lower region of said groove when said needle cylinder has been rotated so as to position said control means at the predetermined selection point to overcome said bias and prevent actuation of control butt by said cam system.

3,885,405

SYSTEM FOR SELECTING THE NEEDLES OF A KNITTING MACHINE ACCORDING TO A PROGRAM

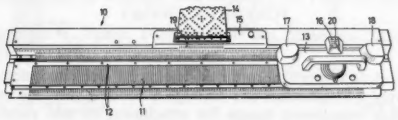
Bartels, Manfred, Cologne, Germany, assignor to Empisal Knitmaster Luxembourg S.A., Luxembourg

Filed July 8, 1974, Ser. No. 486,698

Claims priority, application Germany, July 7, 1973, 2334654; May 11, 1974, 2422880

Int. Cl. D04b *7/00*

U.S. Cl. 66—75 **10 Claims**



1. A system for selecting needles of a knitting machine of the type including a needle bed supporting a plurality of needles disposed in side-by-side relation and a carriage mounted on said needle bed for movement transversing said needle, a mechanical data storage dial carried by said carriage and including a plurality of arms settable to actuate the needles in a pattern, a data carrier associated with said needle bed for traversing by said carriage, and control means responsive to said data carrier for automatically setting said arms, said control means including a reading head carried by said carriage for scanning said data carrier, pulse generator means carried by said carriage for generating an interval pulse when said carriage traverses a distance equal to the spacing of adjacent needles, and circuit means including a gating circuit connected to said reading head and said pulse generator means for transmitting a signal generated by said reading head only in the simultaneous presence of an interval pulse from said pulse generator means, and arm setting means operable in response to said signal to set a corresponding arm of said data storage dial.

3,885,406

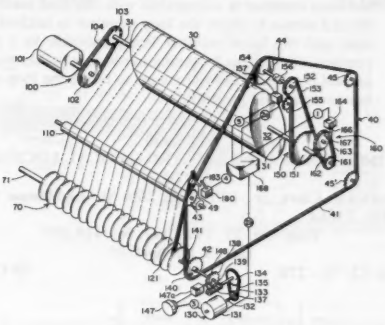
APPARATUS AND METHOD FOR FLUID TREATMENT OF TEXTILE FABRIC IN ROPE FORM

Edward Stanway, Prestbury near Macclesfield, England, assignor to United Merchants and Manufacturers, Inc., New York, N.Y.

Division of Ser. No. 294,914, Oct. 4, 1972. This application Oct. 25, 1973, Ser. No. 409,377

Int. Cl. B05c *3/132;* **G11b** *15/28;* **B65h** *75/02*

U.S. Cl. 68—176 **10 Claims**



1. Apparatus for liquid treatment of textile fabric in rope form comprising tank means containing a liquid treatment bath, a rotatively driven main roller adopted to have said fabric rope engaged upon the peripheral surface thereof to move said rope with a winding motion through said bath, a rotatively driven guide member including recess means within which said fabric rope is engaged for guiding said fabric rope through said liquid bath in a convoluted spiral path, conveyor means engaging one end of said fabric rope and operable to rotatively wind said rope end about said guide member to within said recess means and about said main roller, means for energizing and deenergizing rotation of said conveyor means, means for energizing and deenergizing rotation of said guide member, and control means sensing rotational movement of said main roller and emitting in response thereto a pair of control signals for simultaneously energizing respectively, rotation of said conveyor means and of said guide member, said control signal for energizing said conveyor means being separate and independent from said control signal for energizing said guide member.

3,885,407

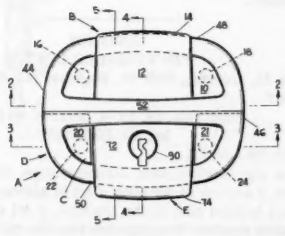
DRAW BOLT

Irving Feinberg, 45 Taggart Way, Saddle Brook, N.J. 07662

Filed Nov. 20, 1973, Ser. No. 417,643

Int. Cl. E05b *65/62*

U.S. Cl. 70—76 **11 Claims**



1. A draw bolt cooperable with a hasp, the draw bolt comprising:

a mounting plate having rail means with a substantially planar first portion and a second portion sloping from the first portion toward the hasp side of the mounting plate;

a manually operable latch member;

means pivotally connecting one end of the latch member to the mounting plate;

a loop member adapted to embrace a hasp; and

means slidably connecting the loop member to the rail means, the latch member being cooperable with the loop member and being movable to a lowered position wherein the loop member is cooperable with the first portion of the rail means to move the loop member to latched position, and the latch member being movable to a raised position wherein the loop member is cooperable with the second portion of the rail means to move the loop member to unlatched position.

3,885,408

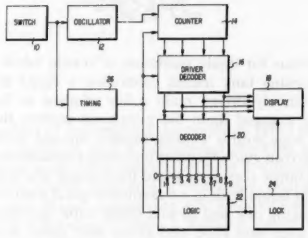
FINGER OPERATED ELECTRO-OPTICAL LOCK AND METHOD

Charles T. Clark, Jr., 2339 N.E. 26th St., Lighthouse Point, Fla. 33064

Filed Oct. 29, 1973, Ser. No. 410,397

Int. Cl. E05b *49/00*

U.S. Cl. 70—278 **10 Claims**



1. A lock system for an enclosure entrance comprising:

manually operable electro-optical switch means internal of the enclosure;

pulse means responsive to said switch means for providing a series of pulses at a predetermined repetition rate;

display means for providing a visual indicia internal of the enclosure related to the number of pulses provided by said pulse means, said display means being positioned for viewing by the operator of said switch means external of the enclosure so that the operation of said switch means may be selectively terminated to effect the display of predetermined visual indicia by said display means to the operator external of the enclosure;

lock means; and,

circuit means internal of the enclosure and responsive to the effecting of the display of predetermined visual indicia by said pulse means for effecting the operation of said lock means.

3,885,409

PIN TUMBLER LOCK

Joseph M. Genakis, 948 W. Boylston St., Worcester, Mass. 01605

Filed Feb. 19, 1974, Ser. No. 443,328

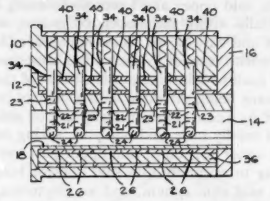
Int. Cl. E05b *9/04*

U.S. Cl. 70—364 A **8 Claims**

1. A pin tumbler lock comprising an enclosure, a plug therein, a keyway in the plug, a set of pinways, a set of multiple part bottom pins in the pinways, a set of independently rotational rings on the plug, one ring for each pinway,

a solid cylindrical sleeve surrounding the plug rings, an aperture in the sleeve for each pinway, a set of independently rotational rings on the sleeve, one ring for each pinway,

an aperture in each ring for the respective pin, means limiting the rotational motion of each ring, and



a set of top and bottom pins in the enclosure and a plug for each pinway for interlocking the plug, rings, and sleeve to the cylinder.

3,885,410

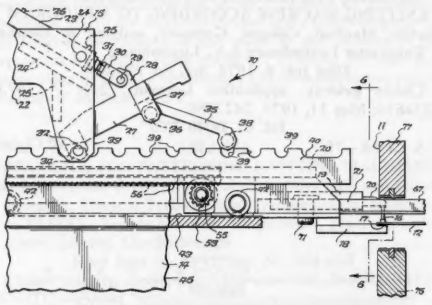
FEED MECHANISM FOR BENDING MACHINE

John F. Kopczynski, 1671 Sweeney St., North Tonawanda, N.Y. 14120

Filed June 26, 1974, Ser. No. 483,455

Int. Cl. B21d *43/10*

U.S. Cl. 72—307 **5 Claims**



1. A feed mechanism for advancing an elongated member having a longitudinal axis through a bending machine comprising attachment means for attachment to said member, advancing means coupled to said attachment means for intermittently advancing said member through said bending machine in predetermined increments in the direction of said longitudinal axis, said advancing means being spaced from said bending machine along said longitudinal axis so that a portion of said member which is not engaged by said attachment means or said bending machine lies between said attachment means and said bending machine, and reinforcement means connecting said advancing means and said bending machine for absorbing the pulling force exerted on said elongated member by said bending machine during bending thereby preventing such pulling force from being transmitted to said advancing means through said elongated member.

3,885,411

MACHINE PRESS FOR FORGING BOLTS AND THE LIKE

Robert Szeliga, Los Angeles, Calif., assignor to Culver Tool & Die Co., Venice, Calif.

Filed Mar. 8, 1974, Ser. No. 449,535

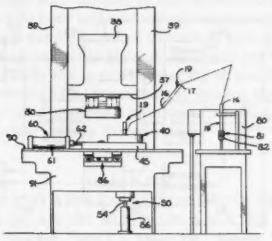
Int. Cl. B21j *1/06, 13/02*

U.S. Cl. 72—342 **4 Claims**

1. In a forging press having a stationary platen and a first and second set of die blocks, said press for forging from stock a formed object having a first and second end in which said first end is hot forged and said second end is cold forged, the improvements comprising:

a. a positioning means for moving said first die block into a first and second position on said platen, in said first position said stock being disposed in said first die block and in said second position said first die block being aligned with said second die block;

b. aligning means for aligning said first and second die block in a first and second position, said means comprised of a plurality of stops disposed on said platen;



c. securing means for holding said stock in alignment with said first and second die block until said first and second die block contact said stock;

d. driving means for driving said press such that said forging is accomplished by a power stroke;

e. withdrawing means for withdrawing said securing means from contact with said stock during said power stroke;

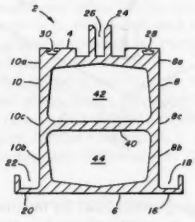
f. ejecting means for ejecting said formed object from said first and second die block; and

g. heating means for heating one end of said stock prior to said stock being disposed in said first die block.

3,885,412
METHOD OF FABRICATING CURVED TUBING AND PRODUCT THEREOF

Lawrence T. Vance, 1429 Little Whale Neck Rd., Merrick, N.Y. 11566

Filed Nov. 21, 1973, Ser. No. 417,890
Int. Cl. B21d *7/00*
U.S. Cl. 72—369 **10 Claims**



1. A method of bending a metal tube comprising

providing an elongated unitary multiwalled seamless metal tube,

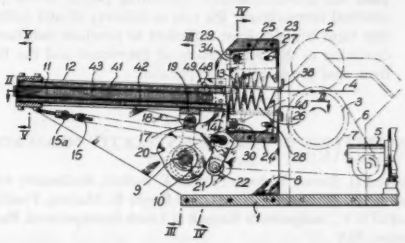
providing said elongated metal tube with an internally disposed elongated web having transverse ends connected to generally opposed walls of said tube and dividing the internal hollow into two generally equal sections, and

bending said tube in a direction generally perpendicular to said elongated web to establish a predetermined tube curvature.

3,885,413
METHOD AND MACHINE FOR FASHIONING SHEET MATERIALS

Wolf Maria Auer, Schmiden bei Stuttgart, Germany, assignor to Bremsen-und-Filter-Handelsgesellschaft mbH, Stuttgart, Germany

Filed May 7, 1973, Ser. No. 357,916
Claims priority, application France, May 19, 1972, 72.18019
Int. Cl. B21d *13/02*
U.S. Cl. 72—385 **16 Claims**

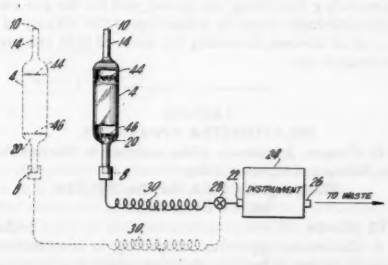


1. A method for pleating or forming chevron patterns on strip sheet material comprising the steps of continually pushing an elongated strip between a pair of opposed forming heads, each having a rake shaping member, cyclically moving said rake shaping members on opposite sides of said strip to engage said strip and form transverse pleats, the rakes of said shaping members having a plurality teeth to engage said strip arranged in alternate opposition to each other and progressively decreasing in pitch in the direction of movement of said strip, withdrawing the lead end of said strip from said rake shaping members and simultaneously moving said strip cyclically toward and away from each of said rake shaping members causing the engagement of said strip into the teeth of one of the opposed shaping members immediately succeeding disengagement from the immediately preceding teeth of the other rake shaping member so as to progressively form said strip into tighter pleats.

3,885,414
PACKAGE FOR CALIBRATION FLUIDS AND PROCESS

John J. Reville, Scotia, N.Y., assignor to General Electric Company, Milwaukee, Wis.

Filed Oct. 24, 1972, Ser. No. 299,844
Int. Cl. G01c *25/00*
U.S. Cl. 73—1 R **10 Claims**



1. A process for calibrating a testing instrument with a fluid calibrated at a pre-selected temperature, said fluid being normally subject to permanent, unpredictable interaction with its surrounding environment due to permeation, diffusion and chemical reaction during the packaging process, shelf storage,

the dispensing process or the use cycle, said process comprising:

a. providing a sealed package maintained at the said pre-selected temperature, said package comprising a rigid hollow vessel of non-permeable material, at least one end of said vessel terminating in a sealed port and a calibration fluid partially or completely filling said vessel and having the characteristics recited hereinabove;

b. opening said sealed port and affixing the opened port to the instrument being calibrated; and

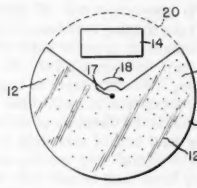
c. delivering said calibration fluid into the instrument to yield the pre-determined calibrating points at the pre-selected temperature, the rate of delivery of said calibration fluid being at least sufficient to preclude substantial deviation in the temperature of the vessel and the fluid from said pre-selected temperature.

3,885,415

CALIBRATION OF PARTICLE VELOCITY MEASURING INSTRUMENT

Richard H. Burns, Webster; Roger E. Button, Rochester; Alexander E. Martens, Fairport, and Roger R. Morton, Penfield, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 19, 1973, Ser. No. 408,217
Int. Cl. G01p *21/00, 5/20*
U.S. Cl. 73—1 D **11 Claims**



1. A calibration apparatus for calibrating a particle velocity measuring instrument defining an optical path for optically viewing particulate matter to generate signals as a function of the velocity of the particulate matter, comprising:

a disc disposed for receiving light emanating from along the defined optical path;

areas of contrast disposed upon the disc for receiving the light emanating from along the optical path to be optically viewed by the particle velocity measuring instrument; and

means for moving the areas of contrast disposed upon the disc at a predetermined rate across the received light emanating from along the optical path for the generation of calibration signals as a function of the velocity of the areas of contrast traversing the received light at a predetermined rate.

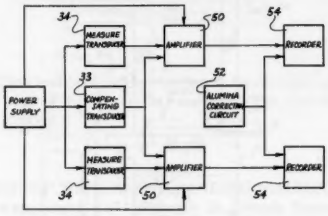
3,885,416

DILATOMETER APPARATUS

Paul G. Cooper, Johnstown, Ohio, assignor to Harrop Precision Furnace, Columbus, Ohio

Filed Aug. 13, 1973, Ser. No. 387,924
Int. Cl. G01h *25/16*
U.S. Cl. 73—16 **2 Claims**

1. A dilatometer apparatus comprising, in combination, a furnace including a furnace chamber adapted to removably receive a plurality of test samples disposed on the base of said chamber; a plurality of sample probes of predetermined known dimensions vertically disposed within said chamber each including a lower end adapted to freely rest on the top of a respective one of said test samples and an upper end extending through the upper wall of said furnace; a compensating probe of the same material and substantially the same dimensions as said sample probe vertically disposed within said chamber and including a lower end resting on the top of a reference sample which rests on the base of said chamber and an upper end extending through the top wall of said furnace; a plurality of first transducing means fixedly mounted above the upper wall of said furnace and each operatively engaging a respective one of said sample probes for sensing and converting the relative vertical movement of each of said probes to an electrical signal; a second transducing means



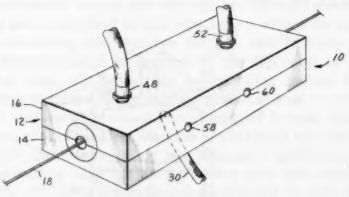
fixedly mounted above the upper wall of said furnace and operatively engaging said compensating probe for sensing and converting the relative vertical movement of said probe and said reference sample to an electrical signal; and measuring circuit means operatively connected to said first and second transducing means to effectively substract that portion of the signal associated with said compensating probe representing the dilation of the probe from each of the signals associated with each of said sample probes and including recording means to visually record only the portion of the signal representing the vertical dilation of the sample.

3,885,417

FLUIDIC GAUGING SENSOR HEAD HAVING A GAS BEARING MATERIAL

Hansjoerg Stern, Schenectady, N.Y., assignor to General Electric Company, New York, N.Y.

Filed June 28, 1973, Ser. No. 374,319
Int. Cl. G01b *13/08*
U.S. Cl. 73—37.7 **14 Claims**



1. A fluidic gauging sensor head for monitoring a characteristic of strand-like material and guiding the material therethrough, comprising:

a. a support block having first and second guide sections and a fluidic sensor section positioned intermediate said first and second guide sections;

b. means for pneumatically isolating said intermediate sensor section from said respective first and second guide sections;

c. each guide section including a uniformly porous gas bearing extending the axial length thereof, a manifold surrounding said gas bearing and extending lengthwise between points adjacent opposite ends of said gas bearing, a supply port extending between said manifold and the periphery of said block;

d. each of said gas bearings having a bore extending the complete length therethrough; and

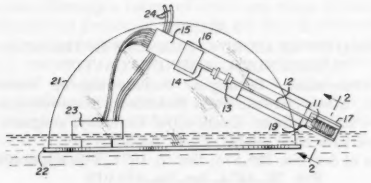
e. said intermediate sensor section including a channel extending lengthwise therethrough and concentrically aligned with each said bore in each of said gas bearings respectively, and means for admitting pressurized fluid to said channel to sense variations in the back pressure therefrom proportional to changes in the characteristic of the material being monitored as the strand-like material passes through said bore in said first guide section, into and through said channel in said sensor section and out through said bore and said second section whereby pressurized gas can be supplied to each of said manifolds for permeating uniformly through each said gas bearing into each of said bores so as to center the strand-like material passing through said bores thereby causing the strand-like material to be centered within said channel in said sensor section while passing therethrough.

3,885,418

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF AN OIL SLICK ON A WATER SURFACE

Anthony R. Kriebel, 340 La Mesa Dr., Menlo Park, Calif. 94025

Filed Oct. 17, 1973, Ser. No. 407,170
Int. Cl. G01n *11/14*
U.S. Cl. 73—61.1 R **18 Claims**



1. Apparatus for sensing the presence of an oil slick on the surface of a body of water comprising

a cylindrical spinner;

a hollow cylindrical shroud partially enveloping said spinner and providing a radial gap between the inner surface thereof and the surface of the spinner, said shroud having an opening therein adjacent said spinner to permit the passage of water and oil to the spinner, said shroud and spinner adapted to be positioned such that the opening in said shroud and said spinner are partially submerged in the surface of the water;

a drive motor for spinning said spinner in said shroud, the torque on said motor being of one value with the water surface free of oil and being of a different value with an oil slick present on the water surface, and

means for detecting the difference in the torque on said motor.

3,885,419

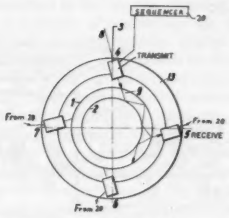
METHOD AND APPARATUS FOR ULTRASONIC TESTING OF TUBES AND RODS

Fritz Witte, Dortmund, and Heinrich Bockstiegel, Witten-Stockum, both of Germany, assignors to Mannesmannrohren Werke Aktiengesellschaft, Dusseldorf, Germany

Filed July 24, 1972, Ser. No. 274,623
Claims priority, application Germany, July 29, 1971, 2138458
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.5 R **8 Claims**

1. Method of continuous testing of rods or pipes, progressively in axial direction and by means of ultrasonic pulses to be received for detection of defects, comprising the steps of, using a plurality of at least three test units arranged in a plane transverse to said axis and in angularly spaced apart relation to each other;

rotating the units on the axis relative to the pipe or rod to be tested;



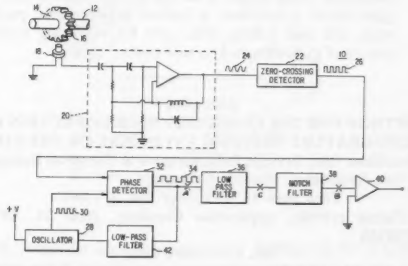
providing for axial movement as between the pipe or rod and the units for progressively testing the pipe or rod; and sequencing the units so that each unit alternates between transmission of ultrasonic energy and responsiveness for receiving such energy, a unit of the plurality operating for receiving being spaced apart from a unit operating for transmission in angular direction corresponding to the direction of transmission into the rod or pipe to be tested.

3,885,420

METHOD AND APPARATUS FOR MEASURING SMALL VARIATIONS IN THE SPEED OF ROTATING SHAFTS

John F. Wolfinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,605
Int. Cl. G01h *1/10*
U.S. Cl. 73—70.1 **9 Claims**



1. Apparatus for detecting instantaneous torsional vibrations in a rotating shaft, said apparatus comprising:

first means for generating a first signal at a frequency proportional to the instantaneous angular velocity of said shaft;

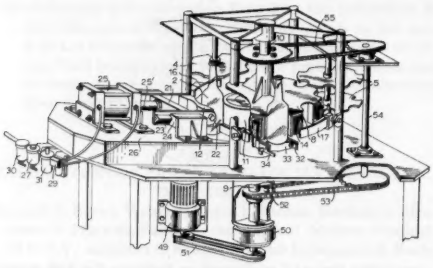
second means for generating a second signal at a frequency proportional to the average angular velocity of said shaft; and

third means connected to receive said first and second signals and responsive thereto to produce a third signal having an average value proportional to the phase difference between said first and second signals.

3,885,421
GLASS CONTAINER TESTING APPARATUS

Rikuzo Nakamura, Hanyushi, and Hiromu Kishigami, Yokohama, both of Japan, assignors to Nittoku Metal Industry Co. Ltd. and Toyo Glass Company Ltd., both of Tokyo, Japan

Filed Dec. 20, 1973, Ser. No. 426,692
Int. Cl. G01n *3/08*
U.S. Cl. 73—94 **2 Claims**



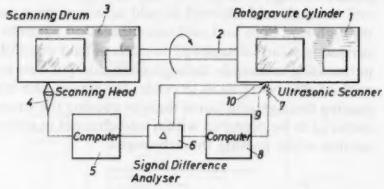
1. A glass container testing apparatus comprising:
a rotating star wheel having receiver pockets equally spaced around the circumference thereof for receiving and directing individual containers through the apparatus;
a movable pusher shoe movable toward and away from the circumference of said star wheel for imparting a test force against a container in one of said receiver pockets;
pusher means connected to said pusher shoe for providing the force necessary to operate said pusher shoe;
a container-rolling roller having a rotational axis parallel to the longitudinal axis of the container to be tested located at a distance below said star wheel and positioned so that said rolling roller abuts the container to be tested in the receiver pocket of said star wheel at a point opposite said pusher shoe so that the container will rotate at least 180° due to the friction exerted against the container between the pusher shoe and the rolling roller; and
brushes between the adjacent receiver pockets of said star wheel for protecting the glass containers adjacent to the container being tested from injury by broken pieces of glass when a container is broken between said pusher shoe and said rolling roller and for removing broken pieces of glass attached to said pusher shoe.

3,885,422
METHOD FOR THE EXAMINATION OR INSPECTION OF ROTOGRAVURE PRINTING CYLINDERS OR THE LIKE

Mamiliano Dini, Brescia, Italy, assignor to European Rotogravure Association, Munich, Germany

Filed June 19, 1973, Ser. No. 371,467
Claims priority, application Germany, June 21, 1972, 2230350
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.8 S **10 Claims**

8. A method for monitoring the depth of cells formed with parallel cell walls in the surface of a rotogravure cylinder and for signifying those cells which are of an improper depth, said method comprising the steps of:
scanning the rotogravure cylinder with an incident ultrasonic beam projected onto the cylinder surface in a plane substantially perpendicular to said cell walls;
measuring the intensity of the portion of said incident beam which is reflected backwardly substantially along and parallel to the incident beam and producing therefrom a first signal representative of the actual depth of the cells then being scanned,
scanning a reference pattern having sensible characteristics thereover representative of desired cell depths for respectively corresponding areas of the rotogravure cylinder and producing a second signal corresponding thereto,
synchronously comparing said first and second signals to produce a first output signal if the actual cell depth is substantially greater than the desired cell depth and a

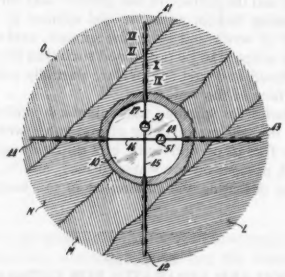


second output signal if the actual cell depth is substantially less than the desired cell depth, and
indicating said first and second output signals in association with respectively corresponding areas of the rotogravure cylinder thereby enabling corrective action.

3,885,423
METHOD OF MEASURING CHANGES IN THE AREA SURROUNDING A MINING CAVITY

Fritz Schuermann, Hattingen, Niederwenigern; Herbert Muller, Essen-Werden; Horst Boddicker, Essen-Kray, and Peter-Paul Heusinger, Essen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Division of Ser. No. 205,576, Dec. 7, 1971. This application Feb. 20, 1974, Ser. No. 439,018
Int. Cl. G01n *33/24*
U.S. Cl. 73—88 E **3 Claims**

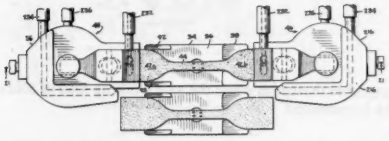


1. Method of measuring changes in the area surrounding a mining cavity consisting in adhesively embedding an elongate rod-like anchor rigidly in a bore hole of such cavity, measuring changes in the strata surrounding the anchor in several planes distributed over the length thereof by a series of operatively connected sensors arranged fixedly and at a predetermined distance to each other, and detecting outside of the bore hole and from the sensors the dimension and speed of changes in the strata.

3,885,424
TENSILE TEST SPECIMEN HOLDER

George E. Ryckman, East Liverpool, Ohio, and Walter J. Budd, Waterbury, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 213,265, Dec. 29, 1971, Pat. No. 3,803,907. This application Jan. 21, 1974, Ser. No. 435,023
Int. Cl. G01n 3/04
U.S. Cl. 73—103 2 Claims

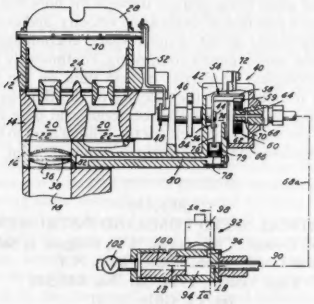


1. A cradle device for holding a sample having widened end portions and an intermediate neck portion, of which said end portions are to be engaged by grippers of a tensile testing apparatus, comprising a cradle member adapted to be incorporated as an element of a conveyor chain for movement therewith and having a flat top sample receiving face extending transversely to the intended direction of movement with two spaced-apart laterally oriented shoulders at each end for receiving the respective widened end portion of the sample therebetween, and the two shoulders at one end of said cradle member forming a recess of a size and shape to receive one widened end portion of a sample and flaring outwardly from an inwardmost narrowest opening for accommodating said neck portion of a sample at the juncture thereof with said one widened end portion to an outwardmost widest opening, the length of said cradle member being such that when a sample is received thereon said widened end portions of the sample extend beyond the ends of said cradle member for engagement by the grippers.

3,885,425
AUTOMATIC CHOKE TESTER

James R. Hughes, Windsor, Ontario, Canada, and John H. St. John, Birmingham, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 303,557, Nov. 3, 1972, Pat. No. 3,808,883. This application June 8, 1973, Ser. No. 368,393
Int. Cl. G01m 15/00
U.S. Cl. 73—118 3 Claims

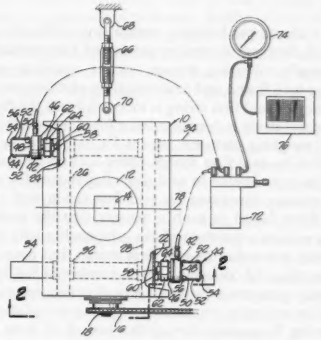


1. A tester for a motor vehicle type automatic choke having a housing enclosing a temperature responsive member operatively connected to an unbalance mounted, air movable choke valve for urging the same towards a position closing the upper end of a carburetor induction passage in response to decreases in temperature level below a predetermined level and movable to a position opening the induction passage in response to airflow thereagainst through the passage, comprising in combination, a rotatable sleeve valve having an air outlet adapted to be connected to the choke housing and an air vent, the sleeve valve being rotatably mounted with respect to a second sleeve closed at its ends and received therein, a vortex generator mounted within the second sleeve and separated therefrom radially by an annular chamber, an air inlet at one end of the second sleeve connected to the annular chamber and adapted to be connected to a source of compressed air, the generator having a plurality of circumferentially spaced tangentially positioned air inlets admitting compressed air to annular interior chamber for swirl of air therein around the interior chamber, a pair of axially directed and located conduits extending in opposite directions and of different diameters less than the diameter of the interior chamber whereby the generator divides the incoming air into a source of colder air flowing in one direction through the smaller diametered conduit and a source of warmer air flowing through the larger diametered conduit, the second sleeve having port means therethrough connected respectively to the colder and warmer air sources, rotation of the sleeve valve to its extreme positions alternately connecting one source to the sleeve valve outlet while connecting the other source to vent, and vice versa, whereby the choke temperature sensitive means may be quickly cooled or heated by rotation of the sleeve valve to simulate choke actual operating temperatures regardless of ambient temperature conditions.

3,885,426
TORQUE SENSING SYSTEM

Ray E. Hudson, Poway, and John W. Knowlton, Laguna Beach, both of Calif., assignors to Martin-Decker Company, Santa Ana, Calif.

Filed Apr. 30, 1973, Ser. No. 355,697
Int. Cl. G01l 3/14
U.S. Cl. 73—136 R 6 Claims



1. A torque sensing system on a drilling rig for a rotary drilling shaft driven by a rotary table, comprising

means for slidably mounting the rotary table on the drilling rig;

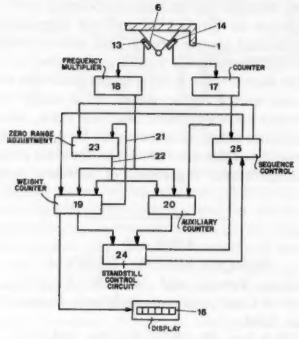
sensing means fixed to the drilling rig for measuring forces tending to rotate the rotary table on said slidable mounting means, said sensing means being capable of providing a force couple to resist rotation of the rotary table; and

means for preventing lateral movement of the rotary table without significantly affecting the resulting forces measured by said sensing means, said means for preventing lateral movement including a rigid link pivotally mounted at one end to said rotary table and at the other end to the drilling rig, said link being perpendicular to the directions in which said sensing means provide the force couple to resist rotation of the rotary table.

3,885,427
ELECTRONIC BALANCE FOR MEASURING MASSES OR FORCES

Domenic Melcher, Uster, and Mario Gallo, Zurich, both of Switzerland, assignors to Wirth, Gallo and Company, Zurich, Switzerland

Filed Aug. 22, 1972, Ser. No. 282,867
Claims priority, application Switzerland, May 16, 1972, 7287/72
Int. Cl. G01l 1/10; G01g 3/16
U.S. Cl. 73—141 R 1 Claim



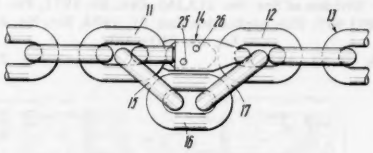
1. An electronic balance, comprising: a frame; a weighing platform; first and second pretensioned electronically excited transversely vibrating strings; means coupling said strings between said frame and said weighing platform such that the frequency of said first string is increased and the frequency of said second string is decreased as a function of a force exerted on said weighing platform; means for detecting the frequency generated by said first string; phase-locked frequency multiplying means coupled to said detecting means for multiplying the frequency generated by said first string with a predetermined fixed factor in such a manner that the multiplied frequency retains a constant phase relationship with the original frequency generated by said first string; first counting means for detecting and counting a given number of full cycles of the frequency generated by said second string; second counting means for counting the number of full cycles of the multiplied first string frequency during the period of time said given number of full cycles of the second string frequency is counted; and means for displaying the output of said second counting means.

3,885,428
OVERLOAD TESTING OF CHAINS

Hans Horst Dalferth, Haydnstrasse 21, 7083 Wasseralfingen, Germany

Filed Dec. 6, 1973, Ser. No. 422,414
Claims priority, application Germany, Dec. 12, 1972, 2261164
Int. Cl. G01l 5/04
U.S. Cl. 73—143 4 Claims

1. An overload indicating device for round link chains for lashing and belaying comprising an indicating chain coupler, said coupler including two spaced elements attachable to two links of said chain, said elements being connected together, and means interposed between said spaced elements and

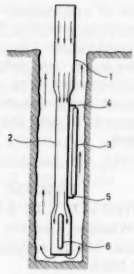


engageable therewith when the safe working load of said chain links is exceeded.

3,885,429
METHOD FOR MEASURING THE RHEOLOGICAL PROPERTIES OF FLUIDS IN THE BORE HOLES OF DEEP-WELLS

Mihaly Megyeri, 25, Oswald utca, and Jeno Molnar, 10, Tolbuchin setany, both of Nagykanisza, Hungary

Filed Nov. 30, 1973, Ser. No. 420,522
Int. Cl. E21b 47/06
U.S. Cl. 73—153 3 Claims



1. In a method of measuring the rheological properties of fluids forming drilling mud in the bore holes of deep-wells, comprising conveying the fluid downwardly into the bore hole interiorly of a hollow bore rod, measuring the viscosity of the drilling mud while being pressed through the bore rod and the bore hole as a function of its shearing velocity, and evacuating the fluid upwardly in the annular space encompassing said bore rod, the improvement comprising; continuously measuring the rheological properties of said fluid on the basis of conditions responsive to the velocity of the fluid in motion while drilling in the annular space about said bore rod, and patterning the shearing velocity of the drilling mud to the most stringent predetermined operating demands thereon.

3,885,430
VERTICAL SPEED COMMAND INSTRUMENT

Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

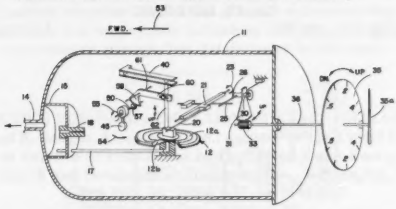
Filed Mar. 6, 1974, Ser. No. 448,541
Int. Cl. G01c 21/10
U.S. Cl. 73—179 8 Claims

1. A vertical speed command for an aircraft comprising:
means for pneumatically sensing the rate of aircraft altitude change as a function of the rate of change of ambient air pressure outside the aircraft and providing a mechanical signal in accordance therewith;
an indicator;

means for coupling the mechanical signal from said sensing means to drive said indicator;

means for providing a mechanical signal in accordance with the horizontal acceleration of the aircraft; and

means for coupling said mechanical signal in accordance with horizontal acceleration to said indicator,



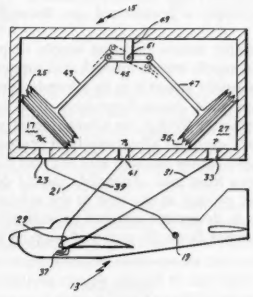
whereby the indicator indicates the rate of change of aircraft altitude which will be attained for a given horizontal aircraft thrust change at the commencement of a change of altitude maneuver and indicates actual rate of aircraft altitude change when horizontal acceleration has terminated.

3,885,431

BALANCE TYPE ANGLE OF ATTACK INDICATOR

Roger W. Gallington, Qtrs. 4307 H, USAF Academy, Colo. 80840

Filed Aug. 28, 1973, Ser. No. 392,376
Int. Cl. G01c *21/00*
U.S. Cl. 73—180 **2 Claims**



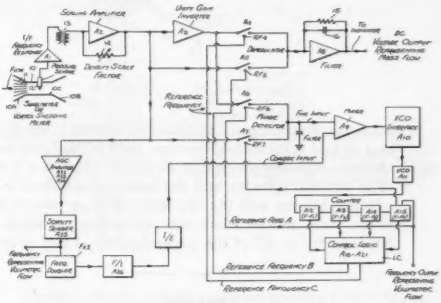
1. A balance type angle of attack indicator for use in an aircraft cockpit instrument comprising means for sensing the pressure in at least three selected positions on the aircraft, one of the selected positions at which the pressure is sensed being the pitot tube of the aircraft, another of the selected positions being the atmospheric pressure at the aircraft static pressure port, and still another of the selected positions being located on the wing of the aircraft, tubing means for transmitting the pressures to a central area, and means for mechanically dividing the difference between one pair of pressures by the difference between a second pair of pressures including an enclosure having three operatively connected sections, the first of said sections being formed in the lower left side portion of the enclosure by the inner surface of a first bellows with a link arm extending angularly upward therefrom, the second of said sections being formed in the lower right side portion of the enclosure by the inner surface of a second bellows with a link arm extending angularly upward therefrom, the third of said sections being formed in the central portion of the enclosure between the first and second sections in operative communication with the outer surface of said first and second bellows, pressure from a different selected position on the aircraft being transmitted to each of the sections in said enclosure, each of said first and second bellows expanding linearly in response to differences in pressure at the selected positions on the aircraft and linkage means connected to said bellows link arms for translating the linear movement of said bellows into rotational movement to give an accurate indication of the angle of attack of the aircraft.

3,885,432

VORTEX-TYPE MASS FLOWMETERS

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Continuation-in-part of Ser. No. 232,058, March 6, 1972, Pat. No. 3,776,033. This application Aug. 2, 1973, Ser. No. 384,792. The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.
Int. Cl.[2] G01F *1/00;* **G01P** *5/08*
U.S. Cl. 73—194 B **8 Claims**



1. Apparatus for measuring the mass flow of a fluid, said apparatus comprising:

A. a vortex meter provided with a flow tube having an obstacle disposed in the flow path of fluid passing through the tube to produce a pulsatory fluidic vortex at a frequency which is a function of flow rate, and a pressure-responsive sensor detecting said fluidic pulses to produce an electrical signal at the same frequency, the amplitude of said signal being a function of the kinetic energy contained in said vortex,

B. amplifier means coupled to said sensor and responsive to said electrical signal, said amplifier means having a gain which is inversely proportional to frequency, thereby dividing the electrical signal by frequency to produce an output signal having a fundamental frequency whose amplitude is indicative of mass flow, said output signal having a noise component representing turbulence introduced into said fluid before it enters said flow tube, and

C. a signal recovery system coupled to said amplifier means to reject said noise component and to pass only said fundamental frequency to an indicator, whereby an accurate reading of mass flow is obtained.

3,885,433

APPARATUS FOR MEASURING THE VELOCITY OF FLOW OF AN ELECTRICALLY CONDUCTIVE FLUID

Lawrence B. Marsh, Silver Spring, Md., assignor to Marsh, McBirney Inc., Rockville, Md.

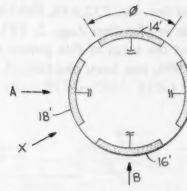
Filed Sept. 21, 1973, Ser. No. 399,734
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 EM **2 Claims**

1. A velocity meter for measuring the relative speed of movement of an electrically conductive fluid, comprising

a. a cylindrical probe adapted for insertion into the fluid normal to said direction of relative movement, said probe having a circular cross-section;

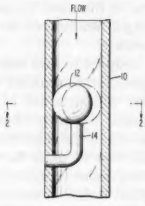
b. means arranged within said probe for producing a magnetic field in the fluid parallel to the longitudinal axis of said probe; and

c. means for generating an electric signal which is a function of the velocity of the fluid relative to said probe, said generating means including a plurality of electrode means mounted on the outer circumferential surface of said probe in a plane normal to the axis thereof, a first pair of said electrode means being diametrically arranged on said probe and a second pair of said electrode means being



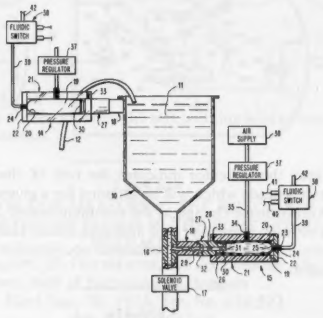
diametrically arranged on a diameter normal to the diameter of said first electrode means, each of said electrode means comprising an arcuate electrode which is a sector of a circular cylinder and the outer circumference of which conforms with the circumferential surface of said probe, said arcuate electrode subtending an angle of between 60° to 80° of the circumference of said probe.

3,885,434
FLOWMETER
Donald E. Williamson, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed Jan. 24, 1974, Ser. No. 436,235
Int. Cl. G01f *1/00*; G01p *5/00*
U.S. Cl. 73—194 B **7 Claims**



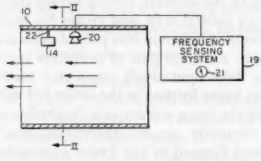
1. A flowmeter for measuring the flow of fluid, comprising:
a. a tube for the flow of fluid to be measured,
b. a spherical ball within the tube having a diameter less than the internal diameter of the tube by an amount sufficient to allow a significant amount of fluid to flow past the ball causing the ball to move,
c. a stationary ball stop positioned in the tube downstream of the ball in the direction of flow preventing movement of the ball in the direction of flow, flow of fluid in the tube past the ball restrained only by the stop and tube walls causing the ball to partake of rotational movement and revolutional movement having a lateral oscillatory component of movement with respect to the axis of the tube which is proportional to the flow of fluid, and
d. means for detecting the lateral oscillatory component of movement of the ball in the tube without being mechanically connected to the ball.

3,885,435
METHOD AND DEVICE FOR DETECTING PRESENCE OR ABSENCE OF A FLUID
Salvatore J. Cascio, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 28, 1974, Ser. No. 473,462
Int. Cl. G01f *23/22*
U.S. Cl. 73—290 R **14 Claims**



1. A device for detecting the presence or absence of a fluid in a tank or the like at a selected level including:
expansible means to contain fluid from the tank when the tank has fluid at the selected level to cause said expansible means to be in an expanded condition;
means to support said expansible means;
means to supply a pressurized gas through said support means;
said expansible means stopping supply of pressurized gas from said supply means through said support means when said expansible means is in its expanded condition due to said expansible means containing fluid because of the tank containing fluid at the selected level, said expansible means collapsing to allow supply of pressurized gas from said supply means through said support means when the fluid flows from said expansible means due to the fluid not being present in the tank at the selected level;
and means to determine whether pressurized gas from said supply means flows through said support means.

3,885,436
TEMPERATURE DETECTING SYSTEM
Charles A. Meyer, Media, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 160,649, July 8, 1971, abandoned. This application Oct. 2, 1973, Ser. No. 402,685
Int. Cl. G01k *11/24*
U.S. Cl. 73—339 A **3 Claims**



1. A system for indicating the average temperature of a fluid flowing through a duct, said system comprising a conduit disposed generally wholly within said duct, said conduit having a plurality of apertures disposed therein to admit fluid from substantially all portions of said duct, said conduit also having an opening disposed therein to provide constant drain-

age of fluid therefrom, whereby the fluid in said conduit is representative of a crosssection of the fluid in the duct, means for producing an acoustical vibration within said conduit, the frequency produced by said acoustical vibration producing means being a function of the sonic velocity of the fluid within the conduit, and means for sensing the frequency of said acoustical vibration within said conduit and converting said frequency to a temperature indication, whereby, immediately, a very accurate average fluid temperature is indicated.

3,885,437

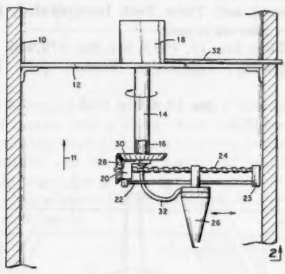
DEVICE FOR SAMPLING EXHAUST STACK EFFLUENT

Paul E. Reagan, Kingston, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 26, 1974, Ser. No. 446,067

Int. Cl. G01n *1/24, 1/26*

U.S. Cl. 73—421.5 A 3 Claims



1. An apparatus for obtaining a substantially homogeneous sampling of an effluent stream flowing through an elongated dry stack, comprising a fixture disposed within said stack, a tubulation supported by said fixture and projecting along the longitudinal axis of the stack, a rotatable shaft disposed within said tubulation, an arm secured to said shaft and extending in a direction orthogonal to the latter with said arm having a length substantially corresponding to the inner radius of said stack and displaceable in a cross-sectional plane of the latter in response to shaft rotation, slide means carried by said arm, an effluent-gathering means affixed to said slide means, gear means coupling said slide means to said tubulation for effecting displacement of said effluent-gathering means along said arm in response to rotation of said shaft.

3,885,438

AUTOMATIC FLUID INJECTOR

Rano J. Harris, Sr., 1945 Carolyn Sue Dr., and Rano J. Harris, Jr., 9880 S. Riveroaks Dr., both of Baton Rouge, La. 70815

Continuation-in-part of Ser. No. 223,663, Feb. 4, 1972, Pat. No. 3,754,443. This application May 31, 1973, Ser. No. 365,552The portion of the term of this patent subsequent to Aug. 28, 1990, has been disclaimed.

Int. Cl. G01n *1/14*

U.S. Cl. 73—422 GC 22 Claims

1. In apparatus for repetitively accurately measuring and injecting preselected quantities of fluid specimens into a media such as an inlet to an analytical instrument, the combination comprising

a housing, which can be mounted adjacent an inlet leading into the analytical instrument,

a tubular member located within the housing, said tubular member including a pair of communicated openings therethrough, a first opening of the pair extending through the tubular member and housing, a second axial opening adjacent to and communicated with the said first opening which can be aligned upon the inlet leading into the analytical instrument,

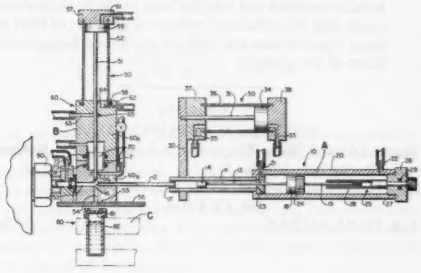
a needle syringe mounted upon the forward end of a piston of a cylinder-piston unit affixed upon the housing, said syringe including

a barrel, including forward and rearward tubular portions, formed by an enclosing wall defining an axial opening,

a chamber of substantially cylindrical-shaped cross section located at the front end of the forward portion of the barrel,

an enlarged chamber opening communicating with and located rearward of the said chamber,

an outlet located within the forward portion of the barrel, rearward of the enlarged chamber opening,



a hollow needle, provided with an opening in the dispensing end thereof, mounted at the forward end of the barrel, the opening through said needle communicating with the axial opening through the barrel,

a reciprocable plunger mounted within the barrel, said plunger including a forward portion fitted snugly within the chamber of substantially cylindrical-shaped cross section located at the forward end of the barrel and a rearward portion provided with an enlarged head of cross-section corresponding substantially with the cross-section of the rearward portion of the barrel within and through which the head moves on reciprocation of the plunger,

a seal located within and separating the forward and rearward portions of said barrel, the plunger being extended therethrough and reciprocable therein such that the head of the plunger traverses the rearward tubular portion of the barrel and the forward portion of the plunger traverses the forward portion of the barrel, a plunger adjustment assembly located within the rearward portion of the barrel, within the path of travel of said plunger, wherein is included an end plug which fits within and encloses the rearward portion of said barrel, and a pair of telescoping members located forward of the said enclosing end plug, and means whereby the pair of telescoping sections can be lengthened or shortened in an axial direction along the length of the rearward tubular portion of the barrel such that the distance travelled by the reciprocable plunger can be preset as desired,

means provided within the rearward tubular portion of the barrel for reciprocation of the plunger,

an injector feed unit including a hollow probe provided with communicating upper and lower side openings mounted on the forward end of a piston of a cylinder-piston unit affixed upon the housing, said probe being aligned upon the said first opening of the tubular member within and through which the probe can be reciprocated by movement of the piston, and extended through the said first opening, and

means for transporting a fluid specimen containing a vial, with a septum cap, below the said first opening and into

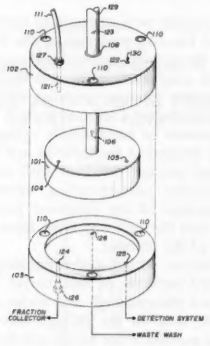
the path of the hollow probe for penetration of the septum for pick-up of the fluid specimen via the lower side opening of the probe and conveyance of same via the upper opening of the probe, through the communication connecting the first and second openings, and into the opening within the dispensing end of the needle and into the cylindrical-shaped chamber in the forward barrel portion of the syringe, which fluid specimen can flow therethrough to the enlarged chamber outlet located within the forward portion of the barrel, and a predetermined quantity of fluid specimen can be trapped and accurately measured within the forward barrel portion of the syringe by forward movement of the tip of the plunger past the outlet and enlarged chamber located within the forward portion of the barrel, the needle of the needle syringe then thrust through the said second opening of the tubular member and into the inlet to the analytical instrument, and the accurately measured quantity of fluid specimen injected into the inlet by continued forward movement of the plunger.

3,885,439

ROTATING SAMPLING VALVE

James Edward Stone, Ringwood, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 24, 1973, Ser. No. 409,341
Int. Cl. G01n *1/20*
U.S. Cl. 73—422 GC **5 Claims**



1. A rotating sample valve comprising:

a. a cylindrical plate containing a plurality of channels parallel to its longitudinal axis, said channels being symmetrically disposed about the center axis of said cylindrical plates;

b. an upper and lower fixed plate between which said cylindrical plate is rotatably mounted, said upper plate and lower plate each containing the same plurality of channels symmetrically disposed around their respective center axis so that such channels are in operative flow relation with corresponding channels in said cylindrical plate;

c. a stepping motor means which is operatively connected to said cylindrical plate, which stepping motor means has a step proportional to the number of channels in each said cylindrical, upper and lower plates;

wherein one of said channels in said upper plate is operatively connected with inlet means for a first liquid stream and the corresponding channel in the lower plate is operatively connected to outlet means,

wherein another of said channels in said upper plate is operatively connected with inlet means for a second liquid stream and the corresponding channel in the lower plate is operatively connected with a second outlet means; and

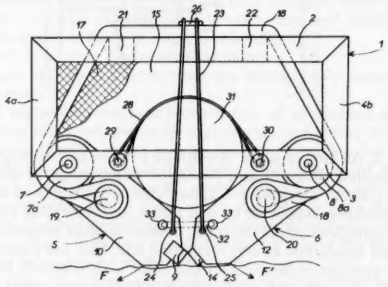
wherein another of said channels in said upper plate is operatively connected with inlet means for a third liquid stream and the corresponding channel of said lower plate is operatively connected with a third outlet means, whereby a signal to said stepping motor means causes rotation of said cylindrical plate relative to said upper and lower plates with concomitant entrapment of any liquid stream contained in said channels in said cylindrical plate and transport of said entrapped stream to the next position of said cylindrical plate with respect to said fixed plates.

3,885,440

FREE-GRAB DEVICE FOR COLLECTING UNDERWATER SAMPLES

Andre Rossfelder, La Jolla, Calif., assignor to Le Nickel; Centre National pour l'Exploitation des Oceans, both of Paris, France and Tetra Tech Incorporated, Rosemead, Calif., part interest to each

Filed July 17, 1973, Ser. No. 379,940
Claims priority, application France, July 19, 1972, 72.26061
Int. Cl. G01n *1/08*
U.S. Cl. 73—425.2 **7 Claims**



1. A free-grab device for collecting underwater samples, the device comprising a box-like frame, the bottom and two side faces of which are covered at least partially by an orificed wall, the other side faces being uncovered; two similar pick-up jaws which are fitted with scraping blades and which are pivoted on said frame to be displaceable between an open position in which they extend generally towards one another and a closed position in which they are in effective engagement with the uncovered side faces of the frame; return means acting on said jaws to urge them outwardly of said open position towards said closed position; releasable locking means acting on said jaws to lock them in said open position; and release means acting on said locking means to free said jaws when the device touches the sea-bed.

3,885,441

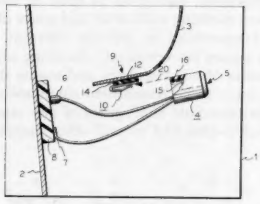
DASHBOARD MOUNT FOR AUXILIARY AUTOMOBILE INSTRUMENT

John Paul Jones, Jr., Wayne, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 275,044, July 25, 1972, abandoned. This application Feb. 14, 1974, Ser. No. 442,424
Int. Cl. G01d *11/24*
U.S. Cl. 73—431 **1 Claim**

1. A mounting structure for an auxiliary instrument on a dashboard of an automobile comprising in combination a spring clip member of resilient metal having a planar area with

a friction clip portion extending therefrom and bent back towards said planar area in a shape to frictionally engage a panel section inserted between the clip portion and the inner surface of said planar area, and an adhesive layer on the outer surface of said planar area of such material that will engage the exposed surface of an automobile dashboard wherein said



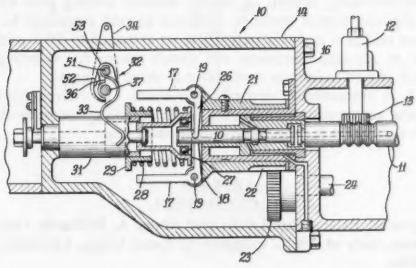
instrument is housed in a casing having a laterally extending back panel section and a visible front indicator panel, said laterally extending back panel section being disposed between said clip portion and the inner surface of said planar area, wherein said casing has recessed in the open back an instrumentation compartment closure substantially closing the rear portion of said casing.

3,885,442

GOVERNOR WITH ADJUSTING MEANS

Paul J. Staebler, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1973, Ser. No. 425,219
Int. Cl. G05d *13/20*
U.S. Cl. 73—543 **5 Claims**



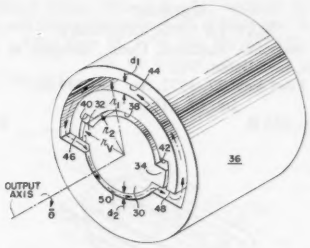
1. In a governor of the type having a governor spring interacting with a plurality of flyweights to regulate the speed of an engine, adjustment means for adjusting said engine regulation comprising a resilient lever having a cantilevered portion acting against said governor spring and adjustable fulcrum means for regulating the length and thereby the spring rate of said cantilevered portion of said resilient lever, wherein said fulcrum means comprises a semi-cylindrical rotatable member rotatably mounted on a shaft and having a first arcuate surface corresponding to a mating surface of the resilient lever and a second arcuate surface intersecting said first arcuate surface to form a shoulder comprising a fulcrum for said cantilevered portion of said resilient lever.

3,885,443

FLOATED GYRO WITH ANGULAR INERTIA COMPENSATION

William C. Albert, Boonton, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed May 24, 1973, Ser. No. 363,428
Int. Cl. G01c *19/20*
U.S. Cl. 74—5 R **9 Claims**



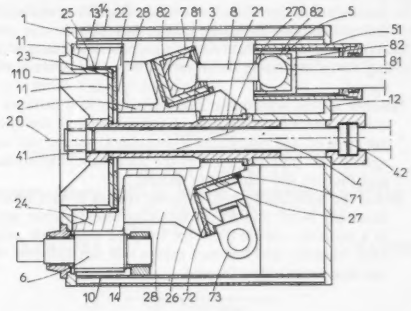
1. A single degree of freedom floated gyro compensation system, comprising a hollow gyro case having an output axis, a gyro float mounted within said case and rotatable about said output axis, floatation fluid filling the space between said case and said float, and duct means formed in said case about said output axis communicating with said floatation fluid for compensating for the inertia of the float with respect to the output axis by means of fluid inertia.

3,885,444

BARREL MECHANISM FOR A PISTON PUMP

Gerard Chanlon, Le Creusot, France, assignor to Creusot-Loire, Paris, France

Filed Nov. 8, 1973, Ser. No. 413,895
Claims priority, application France, Dec. 14, 1972, 72.44532
Int. Cl. F16h *23/08*; **F15h** *23/10*
U.S. Cl. 74—60 **8 Claims**



1. A barrel mechanism comprising:

a. a rotatable shaft having an axial bore;

b. a casing within which said shaft extends and having ends perpendicular to the axis of said shaft;

c. bearings supported respectively by said casing ends and supporting said shaft;

d. a plate fixed to said shaft and extending obliquely with respect to said axis of said shaft;

e. a barrel bearing on said oblique plate, centred about an axis intersecting said axis of said shaft, on an inclined cylindrical bearing perpendicular to said plate;

f. means locking said barrel against rotation;

g. a prestressed tie-rod extending along the said axis of said shaft in said axial bore and connecting said casing ends to

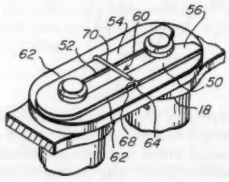
absorb axial thrust on said barrel, said oblique plate being integral with a thrust plate on that end of said casing remote from said barrel with respect to said oblique plate, said thrust plate being fixed to said shaft perpendicular to said axis of said shaft, said tie-rod extending in a tubular distance piece fixed to said two ends of said casing and extending through said axial bore in said shaft.

3,885,445

MASTER LINK ASSEMBLY

Joseph V. Montano, Hartford, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 27, 1972, Ser. No. 309,831
Int. Cl. F16g *13/02*
U.S. Cl. 74—250 R **8 Claims**



1. A master link assembly for releasably coupling the opposing ends of a series of articulated links to form a chain wherein the opposing ends are defined by a pair of roller link assemblies each having a pair of opposing link plates with pitch holes extending between the opposing faces thereof and a pair of tubular bushings press fitted thereinto comprising

first and second link plates each including a pair of pitch holes extending between the opposing faces thereof,

a pair of connecting pins selectively configured for slidable insertion into a tubular bushing and for insertion into the pitch holes of said first and second link plates,

means for limiting the separation of said first and second link plates to a predetermined maximum separation,

said limiting means including a bifurcated clip spring selectively configured for placement about said connecting pins adjacent the outer face of one of said first and second link plates comprising the master link plate,

said one master link plate including a pair of fastener receiving bores extending downwardly from the outer surface therof,

fastener means selectively insertable into said fastener receiving bores for extending about and against the opposing arms of said bifurcated spring clip to secure said arms against said pins and prevent the transverse displacement and thereby the separation thereof,

means for maintaining said fastener means in said fastener receiving bores and for maintaining said fastener means at a position remote from the coupled roller link assemblies whereby said fastener means will not interfere with the free articulation thereof.

3,885,446

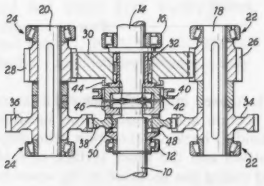
GEARING-TORQUE DIVISION

Eric Alexander Pengilly, Hawkesbury House, Woolton Hill, near Newbury, England

Filed Apr. 27, 1973, Ser. No. 354,955
Claims priority, application United Kingdom, Apr. 29, 1972, 20002/72
Int. Cl. F16h *3/08, 57/02*
U.S. Cl. 74—331 **19 Claims**

1. A transmission comprising first and second rotatable members between which torque is to be transmitted, a first helical gear rotatable with said first member, a plurality of further helical gears meshed with said first gear, coupling means for coupling said further gears with said second member, and mounting means for said first gear arranged to permit said first gear to pivot about an axis transverse to the rotational axis of said first gear under the action of axially directed components of reaction forces arising from said further gears under load so that torque can be transmitted between the members through each of said further helical gears.

11. A transmission comprising first and second members between which torque is to be transmitted; a plurality of intermediate shafts coupled with one of said members; a plurality of gear assemblies each comprising a plurality of helical gears fixed respectively on said intermediate shafts and an associated helical gear meshed with each of the intermediate shaft gears in its assembly, said gears of each of said assemblies having different meshing radii from said gears of each of the other of said assemblies to provide different transmission ratios; clutch means for selectively clutching said associated gears to the other of said members; and torque sharing means for causing torque to be transmitted simultaneously through each of the intermediate shaft gears of any assembly whose associated gear is clutched to said other member, the helix



angles of the gears of each of said assemblies being larger as are the meshing radii of said intermediate shaft gears thereof so that, the larger said meshing radius, the greater the rotational free play between the associated gear and the intermediate shaft gears, said rotational free play being such that an assembly whose associated gear is not clutched to said other member does not prevent transmission of torque by each intermediate shaft gear of an assembly whose associated gear is clutched to the other member.

12. A transmission for obtaining reversible drive from a source of unidirectional, rotational drive comprising an input member for connection with said source, an output member to be reversibly driven, an output member driving gear for driving said output member, first and second couplings between said gear and said input member arranged to drive said gear in opposite directions and clutch means for selecting which of said couplings is effective to drive the gear.

18. A transmission according to claim **17**, wherein said reverse gear means comprises a single gear in constant mesh with said range section intermediate shaft gear.

3,885,447

SHIFT CONTROL

Eugene R. Braun, Royal Oak, and Elmer A. Richards, Oshtemo, both of Mich., assignors to Eaton Corp., Cleveland, Ohio

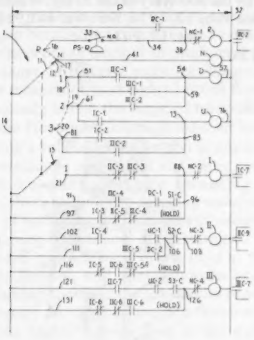
Filed Oct. 9, 1973, Ser. No. 404,189
Int. Cl. F16h *5/50*
U.S. Cl. 74—336 **12 Claims**

1. A semi-automatic, multi-ratio transmission having at least three power paths defining low, intermediate and high speed ratios, the improvement comprising:

speed sensitive controlling means for controlling the automatic shifting of said transmission, said controlling means including first control means for effecting automatic shifting of said transmission only in an upshift direction and second control means for effecting automatic shifting of said transmission only in a downshift direction;

operator controllable selector means coacting with said first and second control means for determining the direction of automatic shifting; and

holding means for preventing downshifting of said transmission when said first control means is activated and for

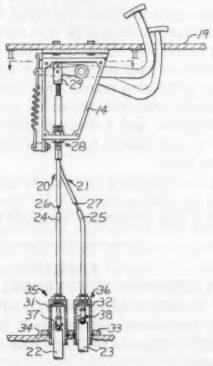


preventing upshifting of said transmission when said second control means is activated.

3,885,448
CONTROL LEVER AND LINKAGE SYSTEM

Duane E. Beals, Decatur; William W. Blake, Wyoming, and Paul C. Rosenberger, Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 272,407, July 17, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,211
Int. Cl. F16c 1/10
U.S. Cl. 74—501 **6 Claims**



1. A sealed control lever and linkage system comprising in combination:

at least one manually manipulatable control lever;

at least one remotely located movable control element;

linkage means including an enclosed flexible cable comprising an outer guide sleeve and an inner flexible wire element slidably mounted within said sleeve for connecting said control lever to said remotely located control element;

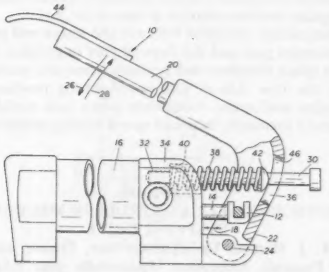
a first housing sealingly enclosing one end of said cable and one end of said control lever, said lever including a shaft rotatably journaled in one wall of said housing and having a first arm secured to said shaft externally of said housing for manual manipulation and a second arm secured to said shaft internally of said housing and detachably secured to one end of said flexible wire element; and

a second housing sealingly enclosing the other end of said cable and the connection of said flexible wire element to said remotely located control element.

3,885,449
FOOT OPERATION FOR A PUMP

Cyril Robert Green, Honesdale, Pa., assignor to Mario D. Medio and Grace E. Medio, both of Malverne, N.Y.

Filed June 24, 1974, Ser. No. 482,492
Int. Cl. G05g 1/14
U.S. Cl. 74—512 **5 Claims**



1. A foot operator for a pump or the like comprising a member mounted for movement from a ready position through a pivotal traverse providing a power stroke, a guide member oriented in the plane of said pivotal traverse operatively arranged to confine said member to said plane during said power stroke, and a return spring so disposed on said guide member as to be compressed during said pivotal traverse and to bias said member through a reverse direction return stroke back into said ready position thereof, said guide member having a portion located along the path of said pivotal traverse in physically abutting relation to said member during said return stroke, whereby said guide member controls the spring bias used for said return stroke by limiting the extent of said reverse direction movement of said member, wherein said guide member is a cylindrical rod which is projected through an arcuate slot in said member.

3,885,450
SPEED-SETTING ARRANGEMENT FOR CAR ACCELERATOR PEDAL

Harold E. Tatum, 4605 St. Rita Dr., Louisville, Ky. 40219

Filed Apr. 10, 1974, Ser. No. 459,536
Int. Cl. G05g 1/14
U.S. Cl. 74—513 **4 Claims**

1. In a car accelerator arrangement for use with an obtuse-angled throttle-connected lever vertically-arranged and nor-

mally biased in its normal idling position, in which its upper and lower ends are urged forwardly and rearwardly respectively, and pivotally secured at its apex to the firewall of a car for swinging movement about the horizontal axis of its apex out of said idling position against said bias through a speed-setting position to a full-throttle position, an improved speed-setting arrangement comprising:

A. a pedal pivot on the lever near its lower end;

B. a foot-operated accelerator pedal, having upper and lower portions, and pivoted at its mid-portion to said pedal pivot for movement bodily therewith to all of said positions and for rocking movement relative thereto between said speed-setting and full-throttle positions;

C. means biasing the accelerator pedal so that its lower portion is normally urged resiliently forward into a given angular position relative to said lever; and

D. stop means mounted between the lower end portion of the pedal part and the firewall part in position to bridge the space therebetween partially when said pedal pivot is on the rear side of said speed-setting position and to bridge said space completely when said pedal pivot is moved forwardly into said speed-setting position.

3,885,451
PYROTECHNICALLY CONTROLLED MECHANICAL STEPPING DRIVE

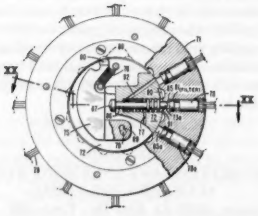
Emile F. J. Hamon, La-Seyne-sur-Mer, France, assignor to Etat Francais, Delegation Ministerielle pour l'Armement, Paris, France

Filed Oct. 24, 1972, Ser. No. 261,108

Claims priority, application France, Mar. 3, 1972, 72.07354; Mar. 3, 1972, 72.07355

Int. Cl. F02n *13/00*

U.S. Cl. 89—1 B **13 Claims**



1. A mechanical stepping drive apparatus, comprising:

a housing having a guide chamber formed therein;

first and second pyrotechnic igniters contained in said housing along and in communication with said guide chamber;

a movable member mounted in said guide chamber for step-by-step sliding movement in a forward direction in said guide chamber;

stopping means for substantially preventing sliding movement of said movable member in a reverse direction;

locking means for locking said movable member into engagement with said first igniter;

unlocking means for unlocking said movable member from engagement with said first igniter by gas pressure produced upon ignition of said first igniter; and

urging means for urging said movable member into sliding movement one step in said forward direction in said guide chamber toward and into locking engagement with said second igniter upon ignition of said first ignitor.

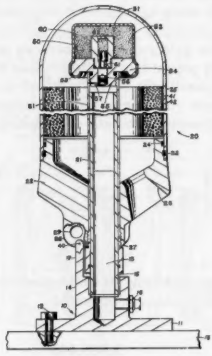
3,885,452
ROCKET CATAPULT AIRCRAFT ESCAPE ARRANGEMENT

Manuel Weinstock, Philadelphia, Pa., and Frank T. Pisano, Voorhees, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 12, 1974, Ser. No. 441,915

Int. Cl. F41f *3/06*

U.S. Cl. 89—1.807 **5 Claims**



1. In an aircraft emergency escape system having a pedestal attached to an aircraft frame and supporting a rocket catapult assembly,

said rocket catapult assembly having a booster tube secured to said pedestal,

a booster propellant charge cartridge positioned in one end of said booster tube adjacent said pedestal,

an electric ignition element secured to said pedestal and in fluid communication with said cartridge,

a rocket motor assembly comprising a launch tube slidably mounted on said booster tube and secured to a rearwardly exhausting nozzle unit, a rocket tube secured to said nozzle unit and containing a cylinder of rocket propellant grain, and a delay rocket motor igniter unit secured to said launch tube adjacent the other end of said booster tube,

a shear pin connecting said nozzle unit to said pedestal, and means on said nozzle unit for connection to a pendant line of a seat occupant's shoulder harness.

3,885,453
REGULATION OF TRAVERSING MOVEMENT OF TARGET ALIGNMENT APPARATUS

Howard P. Higginson, and Robert P. Mack, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 48,787, June 19, 1970, abandoned. This application July 24, 1972, Ser. No. 274,528

Int. Cl. F41f *21/06*

U.S. Cl. 89—37 H **11 Claims**

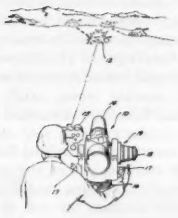
1. In combination, non-Newtonian damped traversing unit and sighting means disposed on said traversing unit for locating and tracking objects;

pivot means providing at least two degrees of movement about azimuth and elevation axes for traversing operations about said axes including movement over a range of traversing rates during operation of the traversing unit;

fluid damper means for respective axes coupled to said pivot means for producing non-linear dampening of said movement about said axes over the range of traversing rates;

said damper means comprising annular sections having spaced, opposing annular surfaces defining a gap and, disposed for relative movement including one of said sections which is coupled to said pivot means to be movable therewith to produce relative movement at a rate which is a function of said traversing rates;

said damper means including a highly viscous fluid disposed in the gap between said sections and engaging the opposing surfaces of the damper to produce shear in said fluid in the range of traverse rates for damping resistance to relative movement, said highly viscous fluid at the desired high viscosity and in the range of traversing rates exhibiting a non-Newtonian characteristic including repeatedly exhibiting a substantial reduction in apparent viscosity in the intermediate and higher traversing rates of the range of each traversing operation exceeding predetermined rates of shear to limit the damping resistance wherein the degree of said reduction is apparent viscosity and limiting of damping resistance is determined by the non-Newtonian characteristic of the fluid at the desired high viscosity thereof, said damper means being constructed and arranged to utilize the substantial reduction in apparent viscosity provided by the non-Newtonian characteristic of the highly viscous fluid in the gap by producing



relative movement of said opposing surfaces including relative movement below and above said predetermined shear rates within the range of traversing rates of the traversing unit to produce non-linearity in damping resistance while maintaining a stable area of fluid contact with the opposing annular surfaces of the sections forming the gap for producing a substantial decreasing rate of damping resistance to higher rates of movement producing relative movement of said opposing surfaces above said predetermined shear rates in the upper range of traversing rates in the operation of said unit wherein said fluid is made responsive to relative movement of said annular sections in the range of shear rates to produce shear stresses in the fluid for non-linear damping resistance over the range of traversing rates for damping of movement of said pivot means about said axis as a function of rate of movement so that the resistance to movement is substantially limited to below a predetermined torque applied to said pivot means for facilitating relative movement exceeding a predetermined desired traversing rate in said range while maintaining damping resistance below said predetermined desired traversing rate for substantial damping of movement of the traversing unit in the lower range of operation thereof.

3,885,454

FLUID ACTUATING DEVICE FOR AN ELECTRIC CIRCUIT BREAKER

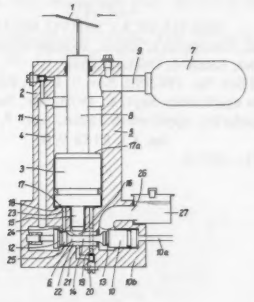
Gerhard Grieger, and Joaquin Bohrdt, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 2, 1973, Ser. No. 375,747

Claims priority, application Germany, July 13, 1972, 2234812

Int. Cl. F15b *15/22, 15/17;* **H01h** *35/38*

U.S. Cl. 91—26 **4 Claims**



1. A fluid actuating device for an electric switching apparatus such as a high-voltage power circuit breaker or the like comprising: an actuator for actuating the electric switching apparatus; said actuator including an actuator cylinder, and a differential piston movable in said cylinder between first and second end-positions corresponding to the open and closed positions respectively of the switching apparatus, said differential piston having two end-faces for receiving fluid pressure force, one of said end-faces having a surface area greater than the surface area of the other one of said two end-faces; high-pressure supply means for supplying fluid to said two end-faces; valve means for alternately interrupting and passing the fluid from said fluid supply means to said one end-face whereby said differential piston is caused to move from said second end-position to said first end-position when said valve means interrupts fluid to said one end-face thereby relieving the fluid pressure thereon; said one end-face of said differential piston and the portion of said actuator cylinder facing towards said one end-face conjointly defining a chamber having a volume that changes in dependence upon the movement of said piston in said actuator cylinder; passage means formed in said actuator cylinder for conducting fluid to and from said chamber in accordance with the movement of said piston between said end-positions; damping means for reducing the speed of said piston in the course of the movement of the same toward said first end-position from said second end-position and before said first end-position is reached, said damping means including: a bypass for conducting fluid away from said chamber, an ancillary piston projecting from said one end-face of said differential piston, said passage means being an opening configured to accommodate and recieve said ancillary piston therein for interrupting the flow of fluid passing therethrough from said chamber before said differential piston reaches said first end-position thereby causing the fluid remaining in said chamber to be conducted away through said bypass whereby the speed of said differential piston is reduced; a second bypass connected in parallel with said first-mentioned bypass; said actuator including a valve-inlet passage for directing fluid from said fluid supply means to said one end-face of said differential piston, and a valve-outlet passage for directing fluid away from said one end-face; and, said valve means comprising a member movable between first and second positions, two valve bodies forming part of said member and corresponding to respective ones of said passages

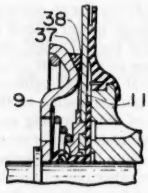
for opening and closing the same in dependence upon the position of said member, and a slide-valve body also forming part of said member for opening and closing said second bypass in the same sense as said valve-inlet passage in opened and closed and so controls the passage of fluid through said second bypass thereby getting fluid to said one end-face of said piston during the time said ancillary piston is still in said opening during the first part of a movement of said differential piston to said second end-position from said first end-position.

3,885,455

MECHANICAL SERVO MEANS

Yasuo Kita, Takarazuka, Japan, assignor to Sumitomo Electric Industries, Limited, Osaka, Japan

Division of Ser. No. 196,998, Nov. 9, 1971, Pat. No. 3,772,963. This application Sept. 6, 1973, Ser. No. 394,901
Claims priority, application Japan, Apr. 9, 1971, 46-22414
Int. Cl. F15b *9/10*
U.S. Cl. 91—369 B **2 Claims**



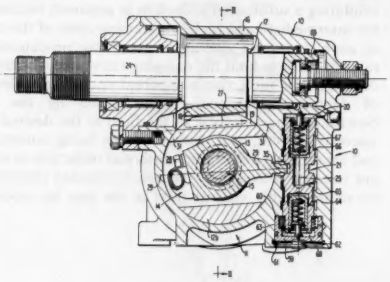
1. In a mechanical servo means of the type including a booster body, a valve body having a hollow portion at its end, a push rod inserted at its one end into the hollow portion of said valve body in a slidable and coaxial relation therewith, a diaphragm having an outer periphery secured to said booster body and an inner periphery secured to said valve body to form a first chamber and a second chamber in said booster body, a finger plate abutting at a portion thereof on a side wall of said diaphrgm and slidable with respect to said push rod, a fulcrum plate secured to said push rod and urged by a return spring in one direction to engage at its outer periphery with the finger plate at a first fulcrum point located radially inwardly from a point at which the resultant force of the pressure on the diaphragm acts, said valve body being provided with passage means for communicating said second chamber with atmosphere, said finger plate having means for opening and closing said passage means, said opening means being adapted also to control the communication between the first chamber and the second chamber; the improvement which comprises resilient means disposed between said finger plate and the fulcrum plate so as to form a second fulcrum point which is radially deviated from said first fulcrum point whereby an effective fulcrum is provided which is displaced from the second point to the first point when the resilient force is overcome by the force exerted by the finger plate toward the fulcrum plate, said resilient means including a rubber ring of triangular cross-section, the outermost annular edge of the rubber ring being in engagement with the finger plate to provide the second fulcrum point.

3,885,456

SERVO-STEERING DEVICE FOR VEHICLES

Hans-Joachim M. Forster, Stuttgart-Riedenberg, and Manfred Bulow, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 269,876, Aug. 7, 1972, abandoned, which is a continuation of Ser. No. 62,039, Aug. 7, 1970, abandoned. This application Nov. 21, 1973, Ser. No. 418,053
Claims priority, application Germany, Aug. 8, 1969, 1940490
Int. Cl. F15b *9/10, 13/04*
U.S. Cl. 91—380 **72 Claims**



1. A servo-steering arrangement for vehicles comprising: housing means, a working piston displaceably supported within a working cylinder formed in said housing means, a steering shaft having toothed segment means in meshing engagement with toothed rack profile means provided on said working piston, a steering nut rotatably supported in said working piston in a position axially fixed with respect to said working piston, a steering worm axially non-displaceably supported within said housing means, said steering nut being helically movably connected with said steering worm, and control slide valve means for controlling fluid flow to working spaces adjacent the working piston, the axes of the steering shaft and the control slide valve means being substantially perpendicular to one another, the axis of the steering shaft being disposed in a diametric plane extending substantially perpendicular to the axis of rotation of the steering nut, the toothed segment means of said steering shaft having a tooth width disposed approximately centric to an axial plane of the housing means, said axial plane extending substantially perpendicularly to the axis of the steering shaft, the longitudinal axis of the working piston being disposed in said axial plane, the working piston being provided with substantially radial aperture means within the area of its toothed rack profile means for the insertion of the steering nut, the center axis of the aperture means being substantially perpendicular to the longitudinal axis of the working piston.

3,885,457

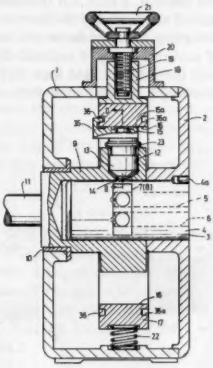
RADIAL PISTON MACHINE

Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 6, 1973, Ser. No. 348,737
Claims priority, application Germany, Apr. 19, 1972, 2218872
Int. Cl. F01b *13/06*
U.S. Cl. 91—488 **8 Claims**

1. In a radial piston machine, a combination comprising a rotary cylinder block having substantially radially extending cylinders; pistons reciprocably extending into said cylinders; a control ring assembly spacedly surrounding said pistons; shoes interposed between said assembly and said pistons; and a ball and socket joint articulately connecting each of said shoes with one of said pistons, the ball of each of said joints having a convex surface whose radius of curvature exceeds the

radius of the respective piston and the socket of each of said joints having a concave surface adjacent to the convex surface of the respective ball and defining therewith a hydrostatic



relief chamber which is in communication with the pressure side of said machine and whose area is at least 90 percent of the cross sectional area of the respective piston.

3,885,458

VEHICLE WHEEL BRAKE ACTUATORS

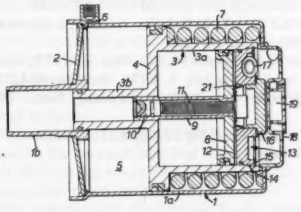
Andrew Charles Walden Wright, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Nov. 26, 1973, Ser. No. 418,919

Claims priority, application United Kingdom, Nov. 28, 1972, 55012/72

Int. Cl. F01b *7/20*

U.S. Cl. 92—52 **7 Claims**



1. A vehicle wheel brake actuator comprising a first cylinder, a first fluid pressure operable member working in said first cylinder, resilient biasing means biasing said first member towards an actuating position, said first member being normally held off by fluid pressure opposing said biasing means, a second cylinder, a second fluid pressure operable member working in said second cylinder and movable between a normal position and an actuating position, output means, means releasably connecting the output means to said second member and movable therewith for transmitting forces of said second member when said second member travels toward its actuating position, means engaging said first member with said second member to transfer the biasing force of said resilient biasing means through said second member and said releasable connecting means to said output means upon release of said opposing fluid pressure, said connecting means comprising axially movable release means releasably connected to said second member for movement therewith between its normal and actuating positions, said release means being axially movable relative to said second member to release the forces of said biasing means acting on said output means following release of said opposing fluid pressure.

3,885,459

TELESCOPIC PISTON-CYLINDER ASSEMBLY FOR HYDRAULIC MACHINES AND MACHINERY COMPONENTS

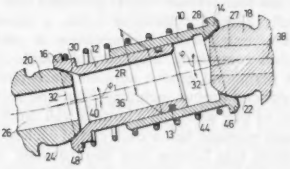
Lennart Werner Freese, Jarfalla, Sweden, assignor to New-Invent S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 114,935, Feb. 12, 1971, Pat. No. 3,742,819. This application Mar. 26, 1973, Ser. No. 345,073

Claims priority, application Sweden, Feb. 20, 1970, 2182/70

Int. Cl. F01b *15/04, 31/00*

U.S. Cl. 92—119 **5 Claims**



1. A telescopic piston cylinder assembly for use with a pressure fluid, comprising:

a telescopic unit having first and second bearing surfaces formed on the opposite ends thereof;

first and second reaction-force absorbing seat means respectively engaging said first and second supporting surfaces for supporting said unit;

said first and second seat means having first and second seating surfaces, respectively, disposed in slidable bearing engagement with said first and second bearing surfaces, respectively, for permitting angular movement of said unit relative to at least one of said seating surfaces;

said telescopic unit having a maximum cross-sectional pressure area defined by a predetermined diameter, and including a sleeve-like cylinder and a sleeve-like piston slidably received in said cylinder, the opposed ends of said cylinder and piston being axially overlapped, the other ends of said cylinder and piston respectively having said first and second bearing surfaces thereon;

passage means communicating with the interior of said unit for permitting pressure fluid to be supplied thereto and removed therefrom;

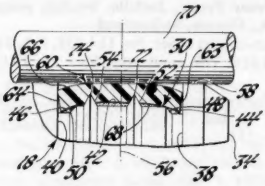
one of said seating surfaces being provided with an internal conical configuration, and the corresponding one of said bearing surfaces as disposed in engagement with said one seating surface having an outer convex spherical configuration whereby it engages said one seating surface substantially along a circular line of contact, said line of contact having a diameter of magnitude similar to said predetermined diameter; and

the other of said seating surfaces being provided with an outer convex spherical configuration, and the other of said bearing surfaces as disposed in engagement with said other seating surface having an internal conical configuration whereby it engages said other seating surface substantially along a circular line of contact having a diameter of magnitude similar to said predetermined diameter.

3,885,460
PISTON RING GROOVE FOR FLUOROCARBON SEAL RINGS

Kwang H. Park, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 2, 1973, Ser. No. 337,377
Int. Cl. F16j 1/02, 9/00
U.S. Cl. 92—249 1 Claim



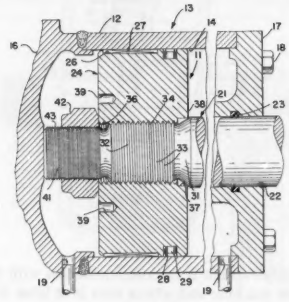
1. In combination with an air conditioning compressor having front and rear cylinder blocks provided with a pair of opposed axially aligned cylindrical bores, a double-acting piston assembly installed for reciprocation in said pair of cylindrical bores comprising, a cylindrical double-acting piston having a peripheral groove adjacent each piston head, each said peripheral groove including front and rear radially extending spaced side walls and a bottom wall, front and rear annular recesses recessed below each end of each said bottom wall and defining said bottom wall therebetween, front and rear V-sectioned ridges asymmetrically located on the periphery of each said bottom wall, said front ridge located forward of and adjacent to the medial transverse plane of its associated groove, said rear ridge located about half-way between said medial transverse plane and said groove rear side wall, the V-sectioned ridges having their peaks radially located substantially intermediate said bottom wall and the outer diameter of the piston, an elastic flexible seal ring received in each of said grooves, each said seal ring being a continuous annular member of polytetrafluorethylene material having an arcuate cross-section, each said seal ring normally in the form of a washer having smooth inner and outer peripheral surfaces, each said seal ring having a thickness substantially equal to the radial depth of its groove measured between the diameter of the groove bottom wall and the diameter of said piston, the seal rings being positioned in their respective grooves with each seal ring outer smooth surface referenced substantially flush with the piston diameter and each seal ring forward and rear edge being positioned adjacent its associated groove radial side wall, said V-sectioned ridges of each groove penetrating the inner peripheral smooth surface of its associated seal ring an amount sufficient to seat the rings therein in a sealed manner such that each seal ring maintains a generally arcuate shape in cross section, and the asymmetrical positioning of the groove V-sectioned ridges insures that the front and rear edges of each seal ring is received into its associated groove front and rear annular recesses an amount sufficient to define a clearancce between the forward portion of the seal rings and the outer diameter of the piston to insure that each of the piston heads will be readily received into their associated opposed cylindrical bores.

3,885,461
SELF-LOCKING PISTON AND ROD ASSEMBLY FOR A FLUID MOTOR OR THE LIKE

Chester A. Crisp, Wilmington, and Herschel M. Williamson, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 23, 1973, Ser. No. 408,668
Int. Cl. F16j 1/12
U.S. Cl. 92—258 1 Claim

1. A piston and piston rod assembly for reciprocation within a cylinder comprising a piston rod having a first portion with threads thereon of a first pitch and having a second portion with threads thereon of a lesser pitch, an annular piston threadably engaged on said first portion of said rod, the threaded engagement of said piston on said rod being wholly at said first portion thereof, a lock nut threadably engaged on said second portion of said rod and in direct engagement with said piston for exerting axial pressure on said piston, said second portion of said rod being of reduced diameter relative to said first portion thereof and said lock nut has an internal diameter correspondingly smaller than that of said piston, a

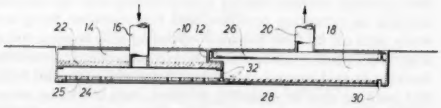


conical step being formed on said rod adjacent said first portion thereof, and said piston has a threaded bore through which said first portion of said rod extends, said bore having theads engaging said threads of said first portion of said rod with the end of said bore adjacent said step being unthreaded and forming with a planar face of said piston a continuous annular sharp edge which bites into said concial step of said rod upon threading of said piston on said first portion of said rod to block fluid flow between said piston and said rod.

3,885,462
DEVICE TO CONDITION ROOMS

Soren Sven Olof Krook, Billesholm, Sweden, assignor to Gullfiber AB, Billesholm, Sweden

Continuation of Ser. No. 412,181, Nov. 2, 1973, abandoned. This application July 1, 1974, Ser. No. 484,772
Claims priority, application Sweden, Nov. 13, 1972, 14727/72
Int. Cl. F24f 13/06; F21v 29/00
U.S. Cl. 98—40 DL 4 Claims



1. A ceiling device to air condition rooms comprising
a box-like, oblong case adapted to be mounted in the ceiling of a room,
a partition in said case extending parallel to the short sides thereof and dividing said case into two parts,

each of said parts having in the top side thereof a central passageway for connection to imput and output air, respectively, and the bottom of the part of the case including the input passageway having therein a plurality of perforations,

a layer of a sound absorbing material positioned in the first-mentioned part of the case a small distance above its perforated bottom,

the other part of said case comprising the light fitting and having one or more openings communicating with the room in which the device is mounted, and

a movable damper mounted in an opening in said partition and movable selectively to connect said other part of the case to said first-mentioned part of the case.

3,885,463

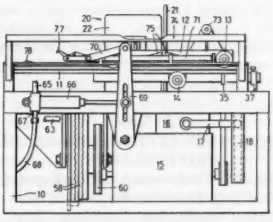
APPARATUS FOR SLICING AND SPREADING BREAD

Mervyn Major Penhallurick, and Colin McGrath, both of Surfers Paradise, Queensland, Australia, assignors to Penmac Distributors, Brisbane, Queensland, Australia

Filed Mar. 22, 1974, Ser. No. 453,782

Int. Cl. B26d *3/28*

U.S. Cl. 99—450.2 **5 Claims**



1. Apparatus for slicing and spreading bread including:

a frame,

a carriage mounted for reciprocal horizontal movement on the frame,

means for reciprocating the carriage,

a loaf holder on the carriage to receive a loaf of bread with one end lowermost,

movable support means for releasably supporting a loaf in the loaf holder,

a pair of vertically spaced substantially horizontal cutters so located that as the carriage and loaf holder are advanced the cutters cut through the lower part of the loaf supported in the loaf holder to sever two slices from the loaf,

a hollow substantially horizontal fixed spreader blade mounted on the frame near to the trailing part of the lower cutter and having an inlet thereto, and outlets from its upper and lower faces, and

means for feeding a spread under pressure to the inlet to the speader for ejection from the spreader outlets onto adjacent surfaces of the two slices severed from the loaf.

3,885,464

POLISHERS FOR CEREALS

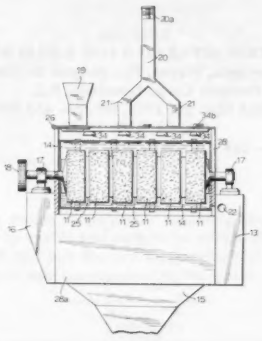
Guillermo Ceballos-Aguilera, Escobedo Sur 733 Suite 201, Monterrey, Nuevo Leon, Mexico

Filed Mar. 15, 1973, Ser. No. 341,555

Int. Cl. B02b *3/02*

U.S. Cl. 99—605 **3 Claims**

1. Improvements in polishers for grains such as sorghum grain, comprising in combination, within a housing, a plurality of polishing disc-like members for frictionally engaging the grain arranged in substantially parallel relationship along the axis of a rotatable cylinder and held thereon to rotate therewith, a mesh surrounding the polishing members and closely spaced therefrom to receive grain bouncing off the members and direct it back to the members, a set of deflector vanes arranged for selective movement from positions substantially parallel to said members and positions deflecting grain bouncing off said polishing members axially along the axis of said rotatable member in a predetermined direction, a feed hopper assembly mounted to feed grain within said housing to the



discs at one end of said rotatable cylinder to thereby be carried to the other end by deflection off said vanes, and a discharge chute at the other end of said rotatable cylinder to remove grains from said housing, suction means to remove hulls from said housing, and means for rotating said cylinder from outside said housing.

3,885,465

HYDRAULIC SUPPORT FOR THE MOVABLY SUPPORTED ROLLER IN ROLL PRESSES

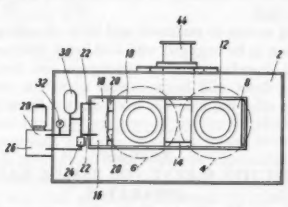
Hans-Georg Bergendahl, Nevelstrasse 32, 463 Bochum, Germany

Filed Feb. 6, 1974, Ser. No. 439,888

Claims priority, application Germany, Feb. 6, 1973, 2305685

Int. Cl. B30b *15/16, 3/04*

U.S. Cl. 100—47 **3 Claims**



1. A hydraulic support for the bearing blocks of a movable roller in a roll press having a frame and two rollers having a gap therebetween, one of said rollers being radially movable away from and toward the other of said rollers, said support comprising:

at least one hydraulic cylinder for each bearing block, mounted between the press frame and the side of the bearing block which is away from the roller gap; and

a hydraulic circuit connected to said cylinder;

a motor pump for supplying hydraulic fluid through said circuit to said cylinder;

a maximum-minimum pressure switch within said circuit for starting said motor pump when a predetermined minimum pressure is reached in said circuit and for stopping said motor pump when a predetermined maximum pressure is reached in said circuit;

a pressurized hydraulic storage tank in said circuit; and

a pressure-limiting valve connected to said hydraulic circuit for releasing sufficient amounts of hydraulic fluid from said circuit, when the pressure within said circuit exceeds a predetermined operating pressure, to keep the pressure within said circuit at said predetermined operating pressure.

3,885,466

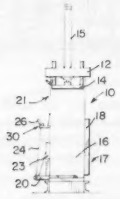
EJECTION APPARATUS FOR A RAM BALER

Vincent J. Cerniglia, Wayne, Pa., assignor to American Environmental Products Corp., Glassboro, N.J.

Filed Mar. 26, 1974, Ser. No. 455,006

Int. Cl. B30b *15/32*

U.S. Cl. 100—218 **15 Claims**



1. In a ram baler having a frame defining a compacting chamber, a platen reciprocable to compress waste material in the compacting chamber into a bale, and a door to provide access to the compacting chamber to remove the bale, a semi-automatic ejection apparatus comprising:

bale ejection means mounted on the frame and adapted to contact the bale of waste material during ejection thereof;

a flexible connector having one end thereof secured to said bale ejection means;

hook means on the platen;

hook engaging means at the other end of said flexible connector, said hook engaging means being engaged with said hook means when the waste material has been compacted into a bale and the door has been opened, the succeeding stroke of the platen causing said bale ejection means to be actuated to eject the bale through the open door; and

retaining means to maintain said hook engaging means in a position to be engaged with said hook means while disengaged therefrom and to disengage said hook engaging means from said hook means upon the stroke of the platen after the bale has been ejected from the baler.

3,885,467

PROTECTIVE SLEEVE FOR REFUSE HANDLING APPARATUS

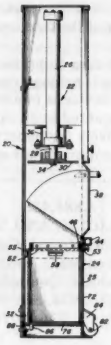
Eugene Merkin, Huntingdon Valley, Pa., assignor to The Union Corporation, Verona, Pa.

Filed Feb. 8, 1972, Ser. No. 224,614

Int. Cl. B30b *15/06*

U.S. Cl. 100—229 A **23 Claims**

1. Refuse-compaction and transportation apparatus comprising a housing, said housing defining a portion of the side walls of a compaction chamber, compaction means mounted in said housing, portable transportation apparatus removably mounted in said housing, said portable transportation apparatus comprising at least a base plate and a front plate secured to said base plate, said front plate defining a portion of the side walls of the compaction chamber, a sleeve positioned on said base plate and within said compaction chamber, said sleeve comprising a rigid reinforcement member at the upper end thereof and a plurality of panels mounted on and extending downwardly from said reinforcement member, at least one of said panels being capable of flexing, at least at the lower region thereof, in a manner substantially independent of adjacent panels, said compaction means being adapted to compact



refuse in said sleeve and against the side walls of said compaction chamber upon flexure of one or more of said panels.

3,885,468

AUTOMATIC TYPE SETTING APPARATUS FOR PRINTING UNITS

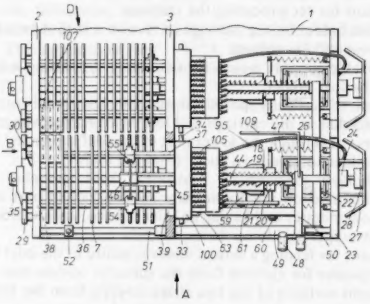
Wolfgang Leihe, No. 9 Bulowplatz, 585 Solingen, Germany

Filed July 16, 1970, Ser. No. 55,521

Claims priority, application Germany, July 22, 1969, 1937128

Int. Cl. B41j *7/08*

U.S. Cl. 101—93.18 **12 Claims**



1. A type setting apparatus for use within a printing unit having a plurality of printing wheels comprising:

a. a plurality of adjusting wheels,

b. each said adjusting wheel including means to individually position a printing wheel of said printing unit when the adjusting wheel is rotated,

c. means to set each adjusting wheel at a preselected rotational position,

d. means for sequentially positioning the setting means adjacent each adjusting wheel, and

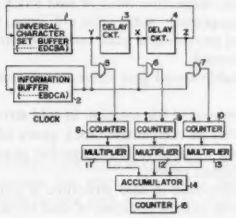
e. means for actuating said setting means to rotate the selected adjusting wheel to said preselected rotational position thereby positioning each printing wheel.

3,885,469

MAGNET OPERATING TIME COMPENSATION SYSTEM

Tadashi Sugimoto, Yokohama; Tyuirito Nagai, Kawasaki, and Isao Shimoda, Oume, all of Japan, assignors to Fujitsu Limited, Japan

Filed July 30, 1973, Ser. No. 383,503
Claims priority, application Japan, July 28, 1972, 47-75766
Int. Cl. B41j 9/26
U.S. Cl. 101—93.48 8 Claims



1. A time compensation control system for use in a line printer wherein for each successive line of characters to be printed in accordance with printing information supplied to the system, the line printer presents, in common, at each character print position of the print line and in each print interval of a cycle of plural time sequential print intervals, a corresponding one of plural character types available for printing, and wherein printing of a common type character at print positions of a line selected in accordance with said printing information is effected by a drive voltage generated for each such print interval, the generation of the drive voltage and thus the instant of printing in response to the drive voltage in a given print interval being controlled in accordance with the duration of a compensation time, comprising:

means for storing printing information signals corresponding to the characters to be printed in a line, for each of successive lines,

means for detecting from the printing information signals of said storing means each character of a given, common type to be printed on a line simultaneously and during a corresponding print interval,

means responsive to the number of common type characters detected by said detecting means for predicting a resultant change in the drive voltage during the said corresponding print interval, and

means for adjusting the duration of the compensation time in accordance with the said predicted resultant change in the drive voltage, thereby to control the timing of the drive voltage and thereby the instant of printing impact during the said corresponding print interval.

3,885,470

CAMMING SYSTEM INCLUDING A FLEXIBLE CAM OF ADJUSTABLE PERIPHERAL LENGTH

Robert B. Costa, Covina, and Edward M. Troup, Mt. Baldy, both of Calif., assignors to Clemar Manufacturing Corporation, Glendora, Calif.

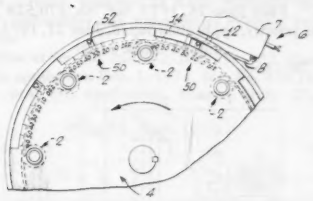
Filed Nov. 8, 1973, Ser. No. 413,885
Int. Cl. F16h 53/00
U.S. Cl. 74—568 R 17 Claims

1. For use in a camming system including a sensor and a cam carrier mounted for motion relative to each other along a predetermined path of motion, an adjustable cam assembly comprising:

an elongate guide track on the carrier;

an elongate flexible cam movable along said guide track, said cam having opposite longitudinal ends, said guide track supporing said cam with at least a longitudinally extending portion of said cam exposed to and facing towards the sensor to be sensed thereby when proximate to the sensor.

a hub fixedly secured to one longitudinal end of said cam; and



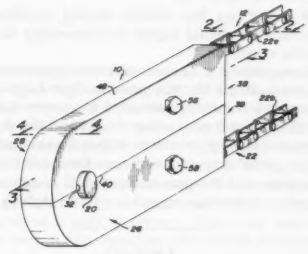
mounting means for rotatably mounting said hub on the carrier to enable said cam to be selectively would onto and off said hub to vary the longitudinal exent of the portion of said cam exposed to the sensor.

3,885,471

GUARD ASSEMBLY FOR ENDLESS FLEXIBLE DRIVE MEMBERS

Richard L. Morine, Mentor, and James J. Hokes, Lakewood, both of Ohio, assignors to Fedco Inc., Mentor, Ohio

Continuation of Ser. No. 338,873, March 7, 1973. This application Feb. 25, 1974, Ser. No. 445,748
Int. Cl. F16p 1/00
U.S. Cl. 74—611 11 Claims



1. A guard for drive systems of the type including a shaft mounted, generally circular, rotatable power member about which travels an endless, flexible power transmitting member, said guard comprising:

a pair of side wall portions positioned on axially opposite sides of said power member and extending generally parallel thereto, said wall portions having a radial extend greater than the maximum radial extent of said generally circular power member;

an opening formed through at least one of said wall portions and sized to receive said shaft, the inner periphery of said opening being defined by a bearing surface which rotatably receives said shaft;

a connecting wall portion extending between said side wall portions at a location radially outwardly of said generally circular power member and enclosing the generally circular power member;

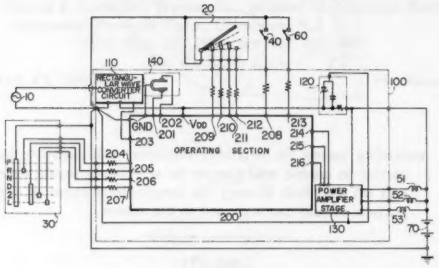
a second bearing surface carried by said guard and engaging said endless power transmitting member at a location spaced a substantial distance from said generally circular power member; and,

an intermediate connector portion extending between said side wall portions.

3,885,472
ELECTRICAL CONTROL SYSTEM FOR AUTOMATIC VEHICLE TRANSMISSION

Hisato Wakamatsu, Toyota; Hiroshi Fujinami, Kariya, and Toshihiro Kamiya, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio-shi, Japan

Filed June 15, 1973, Ser. No. 370,528
Claims priority, application Japan, June 21, 1972, 47-62648
Int. Cl. B60k *21/00*
U.S. Cl. 74—866 **17 Claims**



1. In an automatic transmission having means for shifting the gear positions of a vehicle driving system, an electrical control system comprising:

converting means for detecting the speed of a vehicle and generating a converted signal, said converted signal having a fixed frequency when the vehicle speed is below a predetermined level and having a frequency proportional to the vehicle speed when the vehicle speed is above the predetermined level,

means for setting the vehicle driving condition and for generating a digital signal corresponding to a selected driving condition,

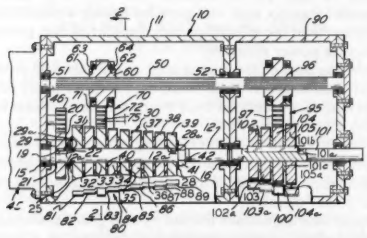
means responsive to the movement of an accelerator pedal for generating a throttle position digital signal, and

logic operation means connected to receive the converted signal from said converting means and the digital signals from said driving condition setting means and said accelerator pedal responsive means for performing a logic operation and for generating a shift command signal to thereby control the operation of said shifting means.

3,885,473
ADJUSTABLE SPEED GEAR DRIVE USING MULTIPLE CONE GEARING

Andrew Stratienko, 8503 Elliston Dr., Philadelphia, Pa. 19118

Filed Jan. 22, 1973, Ser. No. 325,546
Int. Cl. F16h *3/22*
U.S. Cl. 74—349 **14 Claims**



1. An adjustable speed gear drive comprising in combination:

a common structure;

gear stock means mounted for rotation in said structure, including a plurality of stock gears of various predetermined sizes mounted for rotation on a stock shaft, for providing a plurality of engageable stock gears arranged in a progressively descending order;

torsional engagement means mounted on said gear stock means for securing said stock gears to said stock shaft to a predetermined level of torsional engagement; and

yoke means mounted in said structure for selective translation between respective ones of said stock gears in concurrent engagement with adjacent ones thereof while running and providing a gear ratio corresponding to the gear size thereof.

14. An adjustable speed gear drive comprising:

a structure;

stock means mounted for rotation in said structure, including a plurality of concentric stock gears of various sizes for providing a plurality of engageable gears arranged in a predetermined order;

a yoke shaft disposed in said structure in parallel arrangement with the axis of rotation of said stock gears;

a yoke pivotally and slidably mounted at one end thereof on said yoke shaft;

an idler gear mounted for rotation in said yoke for selective engagement of said stock gears;

register means formed in said structure for receiving the other end of said yoke;

drive means disposed in said structure for engagement with said idler gear;

adjustable gear drive means operatively connected to said yoke shaft, including a shaft, a plurality of concentric gears of predetermined sizes mounted in descending order for rotation on said shaft, friction means interposed between said shaft and said gears for securing said gears to said shaft to a predetermined level of frictional engagement;

idler means carrying an idler gear pivotally and slidably mounted in said structure for selective translation between respective ones of said concentric gears in concurrent engagement with adjacent ones thereof for engaging respective ones of said gears; and

gear means disposed in said structure for continuous engagement with said idler gear whereby said adjustable gear drive means having said adjustable gears of said predetermined sizes are selected to produce a group of total ratios of said adjustable speed gear drive and said adjustable gear drive with magnitude intermediate of any two ratios produced by any adjacent said stock gears of said adjustable speed gear drive.

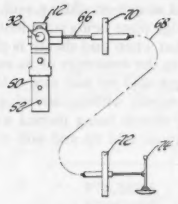
3,885,474
MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY INCLUDING A CABLE CONNECTOR ASSEMBLY

Louis T. Horvath, Solon, and Robert K. Farrington, Shaker Heights, both of Ohio, assignors to Teleflex Incorporated, Cleveland, Ohio

Filed July 16, 1973, Ser. No. 379,477
Int. Cl. F16c *1/18, 1/06*
U.S. Cl. 74—501 R **36 Claims**

1. A motion transmitting remote control assembly for transmitting motion along a curved path comprising: a conduit, a flexible cable slidably disposed within said conduit, a control member, and terminal connector means for connecting said cable to said control member so that said control member moves with said cable; said terminal connector means including a housing, pivotal connection means for connecting said housing to said control member to permit rotation of said housing with respect to said control member about a first axis, and an elongated cable attachment means supported within said housing for rotation about its longitudinal axis, said longitudinal axis of said cable attachment means being disposed

transversely to said first axis; said cable attachment means comprising a hollow cylindrical member including a first end having an internal diameter of one size and a second end having an internal diameter of a different size for selectively receiving one of two cables having different sized ends.

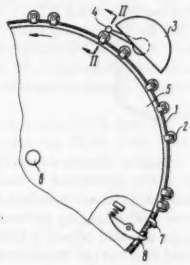


22. An assembly as set forth in claim 21 wherein said assembly includes means for preventing axial movement of said cable attachment means with respect to said housing.

3,885,475
PROGRAM CONTROL APPARATUS

Vladimir Nikolaevich Shubin, Pervomaiskaya ulitsa 1, kv. 103; Samuil Moiseevich Polyak, Tankovy Proezd, 1, kv. 55, and Viktor Sergeevich Silantiev, Kastanaenskaya ulitsa, 57, korpus 1, kv. 58, all of Moscow, U.S.S.R.

Filed Dec. 10, 1973, Ser. No. 423,531
Int. Cl. F16h *53/08*
U.S. Cl. 74—568 R **3 Claims**

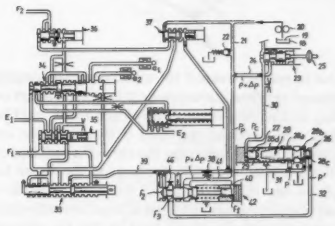


1. A program control device for a tube bending machine and the like, wherein the machine has a framework, operative members, and a drive; the device comprising: a command device mounted on said framework and including stationary followers controlling the operation of corresponding ones of said members; a disc rotatable by said drive; a program carrier in the form of a flexible band tensioned about the cylindrical periphery of said disc and secured thereto, including successive peripheral sections of said band; cams arranged on said band in transversal arrays that are substantially parallel to the axis of said disc, for successive engagement of each cam, in respective peripheral rows about said band, by a respective one of said followers during the rotation of said disc; said transversal cam arrays being removably and slidably mounted on said band, each array including a number of said cams coaxially received about a common spindle which extends across said band; said cams being disposed on said spindles in accordance with a preset program within corresponding ones of said peripheral rows; said followers being mounted at predetermined locations above said corresponding peripheral cam rows, to provide for the preset program and the modification of that program during the operation of the machine; and means for positioning said cams within said arrays across said band at any one of said locations, and also for positioning said transversal cam arrays in a stepless manner at any one of said peripheral band sections, thereby to provide the preset program.

3,885,476
PRESSURE REGULATION CONTROL VALVE FOR AN HYDRAULIC CONTROL SYSTEM OF AN AUTOMATIC POWER TRANSMISSION

François Jean-Louis Leorat, and André Mouttet, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Continuation of Ser. No. 264,332, June 19, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 438,768
Claims priority, application France, July 21, 1971, 71.26656
Int. Cl. B60k *19/00*
U.S. Cl. 74—863 **4 Claims**



1. A pressure regulation control valve for a hydraulic control system of an automatic power transmission mechanism having friction devices for providing stepped gear ratios and comprising: a pressure fluid pump, a fluid reservoir, a pump output pressure regulating device and input and output lines for the fluid from and toward said friction devices operated through a selector valve, said control valve comprising:

in a body first and a second output conduits for communication between a central control valve and said friction devices lines; a distributor member of the slidable differential spool type with a plurality of control faces; a fluid pressure restriction means having its inlet in communication both with a delivery line communicating said pump with a first end face of the distributor spool member and to the input of a first flow way leading to a feed line of said selector valve, and its outlet in communication jointly with a second end face of said distributor spool member and with the input of a second flow-way communicating with a guaged orifice in the body opening into said fluid reservoir and into a connection line of said pump output pressure regulating device, wherein:

a. in a first initial position said distributor spool member is in abutment with said valve body under action exerted by fluid pressure on said first end face and said second end face of said distributor spool member, said first flow way and second flow way;

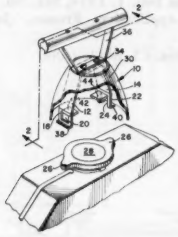
b. in a second intermediate position of said distributor spool member, obtained by the action of fluid pressure on said first and second end faces of said distributor spool member and on a third intermediate face near the output of said second flow way, both first and second flow ways are obstructed; and

c. in a third position of said distributor spool member, obtained by the action of fluid pressures on said first, second and third faces of said distributor spool member, said first and second flow ways are opened.

3,885,477
WRENCH FOR REMOVING AUTOMOBILE RADIATOR CAPS

Alvin L. Shook, 301 S. Pearl, Salem, Ill. 62881

Filed Oct. 25, 1973, Ser. No. 409,663
Int. Cl. B67b 7/16; B25b 13/48
U.S. Cl. 81—3.1 R 2 Claims

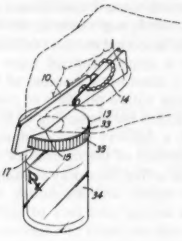


1. An improved wrench for a radiator cap comprising a pair of opposed resilient jaws arranged in spaced apart cooperating relation and having inner confronting faces, said jaws having terminal end portions provided with transverse cut-out portions for engagably receiving the ears of a radiator cap and flat lateral shoulders integrally formed on the inner faces of the jaws from the material cut-out from the jaws to define the cut-out portions which material is bent inwardly and upwardly and arranged laterally of the jaws so that the shoulders extend in an inwardly facing coplanar relation from the jaws,

3,885,478
TOOL FOR REMOVING CAPS FROM CONTAINERS

William Richard Evans, 2090 Zelda Dr., N.E., Atlanta, Ga. 30345

Filed Sept. 7, 1973, Ser. No. 395,188
Int. Cl. B67b 7/14
U.S. Cl. 81—3.46 R 3 Claims



1. A tool for manually removing caps from containers comprising:

a. an elongated integral rigid bar having a handle portion and a head portion, said handle portions having approximately parallel back and bottom edges, said head portion having a recess defining wall extending toward the head end of said bar from and at an incline to said bottom edge to define at the junction of said recess defining wall and said bottom edge a fulcrum shoulder, said head portion of said bar also having a U-shaped recess defined by said recess defining wall and by a straight recess defining edge spaced from and opposite said recess defining wall and by a straight recess bottom edge joining the ends of said wall and said recess defining edge, said head portion having a tapered spike tip adjacent said recess and defined in part by said recess defining edge;

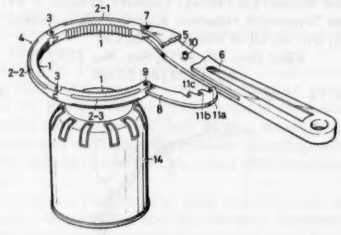
b. a transverse pivot pin in said handle portion of said bar, said pivot pin being disposed intermediate the ends of said bar; and

c. a sheath on said pivot pin, said sheath having a pair of opposed spaced parallel side plates and a bridge plate at the distal end portion of said sheath joining the adjacent edges of said side plates, said side plates at the proximal end portion of said sheath straddling said bar, said side plates and said bridge plate being sufficiently long and of such dimensions that when said sheath is pivoted toward said head portion to the extremity of its movement, said bridge plate engages said tip and said side plates cover said tip and said recess without covering entirely said head portion, said sheath being pivotal away from said head portion to expose said tip and said recess.

3,885,479
WRENCH

Komei Ono, No. 19-33-315, 5-chome, Narimasu, Tokyo, Japan

Filed May 18, 1973, Ser. No. 361,453
Claims priority, application Japan, June 19, 1972, 47-71371; Sept. 5, 1972, 47-103611
Int. Cl. B25b 13/52
U.S. Cl. 81—66 R 3 Claims



1. A wrench for engaging objects comprising exactly three curved members pivotally connected to each other, each of said first, second and third curved members having an engaging portion, the three said engaging portions being the only portions which engage the said object, a lever which is pivotally connected to said first curved member at one end of the connected curved members in their engaged position, said lever having a handle portion near one of its ends and means near its opposite end pivotally connecting said lever and said first curved member, a clamping member which extends outwardly from said connected curved members when they are in their engaged position, said clamping member being pivotally connected near its inner end to said third curved member near the end of said curved member opposite its pivot connection to said second curved member, said clamping member and said lever having adjustable means for removably engaging said clamping member and said lever, said adjusting means on said lever being between said handle portion and its said pivot connection means, said adjustable means consisting of a pin and a plurality of hooks.

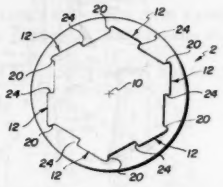
3,885,480
TORQUE-TRANSMITTING ARRANGEMENT FOR FASTENERS AND THE LIKE

Herman G. Muenchinger, South Dartmouth, Mass., assignor to Research Engineering & Manufacturing Inc., New Bedford, Mass.

Filed Dec. 7, 1973, Ser. No. 422,836
Int. Cl. B25b 13/06
U.S. Cl. 81—121 R 9 Claims

1. An article of manufacture comprising a body having a central axis, a first series of surfaces each being equally spaced from said central axis, said surfaces each having opposite ends

and being disposed about said central axis with said opposite ends of each surface being circumferentially spaced from the adjacent surfaces of said series, said surfaces having flat portions between their opposite ends, said flat portions being in planes that intersect to form a regular hexagon that is centered on said axis, the body at corresponding ones of said opposite ends having a second series of surfaces respectively lying in planes that intersect said central axis, and the body at the



corresponding others of said opposite ends having a third series of surfaces respectively lying in other planes that intersect said central axis, the surfaces of said series all facing circumferentially in the same direction and the surfaces of said third series all facing in the opposite circumferential direction, the surfaces of said second series extending to radial distances from said central axis that are greater than the distances that the surfaces of said third series extend from said central axis.

3,885,481

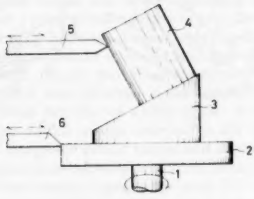
METHOD TO PRODUCE AN OVAL PRODUCT HAVING OVAL CIRCUMFERENCE BY CUTTING PROCESS

Jujiro Okada, No. 69, Chodo-1-Chome, and Isamu Satoo, No. 11/17, Fukae-Minami-2-chome, Higashinari-ku, both of Osaka, Japan

Filed Nov. 30, 1973, Ser. No. 420,461

Int. Cl. B23b *3/00, 3/28*

U.S. Cl. 82—1 C **1 Claim**



1. A method of cutting an object having an oval circumference comprising the steps of:

fixing a cylindrical body to one end of a rotatable main shaft at a prescribed angle to the shaft such that a plane cutting through the inclined cylindrical body at right angles to the axis of the main shaft will define the oval shape of the desired oval product;

biasing a tracing apparatus against the circumference of the cylindrical body at the circumference of the body where said plane at right angles to the axis of the shaft defines the desired oval circumference at the position where the center of the defined oval corresponds to the axis of said main shaft;

cutting a master cam from material fixed onto the main shaft using said tracing apparatus connected to a cutting means whereby the master cam cut from the material by said cutting means corresponds to the oval circumference of the inclined cylindrical body traced by said tracing apparatus; and

cutting the desired oval object from material fixed to the main shaft using said tracing apparatus connected to said cutting means to trace around the circumference of said master cam, thereby cutting the desired oval shape similar to the oval circumference of the inclined cylindrical body originally traced by the tracing apparatus to form said master cam.

3,885,482

DEVICE FOR FEEDING ADHESIVE STRIPS TO A FRANKING MACHINE

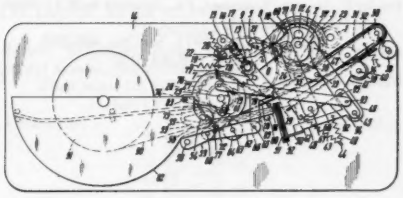
Horst Denzin, Berlin, Germany, assignor to Francotyp GmbH, Berlin, Germany

Filed Apr. 18, 1973, Ser. No. 352,724

Claims priority, application Germany, Apr. 20, 1972, 2219146

Int. Cl.² G07B *17/00*

U.S. Cl. 83—241 **9 Claims**



1. A device for infinitely adjusting within a given adjusting range the length of adhesive strips in a franking machine having a printing mechanism, the adhesive strips being drawn from a storage roll and, after having been severed therefrom, being fed to the printing mechanism, along a given guiding path, comprising manual adjusting means adjustable for varying the travel length within a given adjustment range of adhesive strips that are to be issued by the franking machine, a trigger lever means for releasing travel of the adhesive strips, means for blocking said trigger lever means, means for arresting a cassette wherein the storage roll is received, and means for pivoting into and out of operating position a means defining the given guiding path.

3,885,483

SAW APPARATUS

Akira Ikeya; Hiroshi Ueno, and Toshiyuki Suzuki, all of Hamakita, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Continuation of Ser. No. 284,150, Aug. 28, 1972, abandoned.

This application Oct. 16, 1973, Ser. No. 406,957

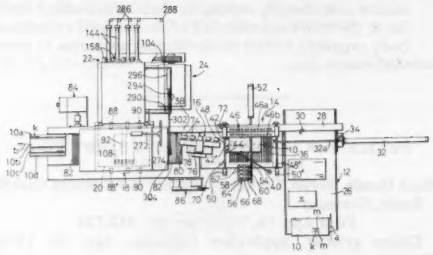
Claims priority, application Japan, Aug. 17, 1971, 46-77691; Aug. 27, 1971, 46-77692; Aug. 27, 1971, 46-66037; Aug. 27, 1971, 46-66038; Aug. 27, 1971, 46-66039; Apr. 29, 1972, 47-43001

Int. Cl. B26d *5/34;* **B27b** *7/04*

U.S. Cl. 83—365 **14 Claims**

1. A saw apparatus for cutting a board into sections in accordance with at least one marking applied thereto, comprising at least one blade conveying means for conveying the marked board in a predetermined path which is aligned with said at least one saw blade, scanning means operable to detect said at least one marking on the board, signal generating means responsive to said scanning means for producing a

signal representative of the location of said at least one marking, and saw-blade shifting means responsive to said signal for



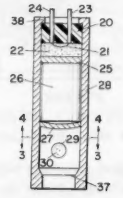
axially moving said at least one saw blade to a position aligned with said marking.

3,885,484

EXPLOSIVELY ACTUATED COMPRESSED DISC LINE CUTTER

Daniel C. Sturgis, Tamaqua, Pa., assignor to ICI United States Inc., Wilmington, Del.

Filed Oct. 23, 1973, Ser. No. 408,505
Int. Cl. B26d *5/08*
U.S. Cl. 83—580 **7 Claims**



1. A line cutting tool comprising:
a. a tubular casing having at least one pair of opposing openings through its walls for the insertion of a line therethrough,
b. a moveable, tempered disc having contact with the interior walls of said casing,
c. means for pushing said disc under compression to pass by said openings such that a line inserted through said openings is severed into three sections.

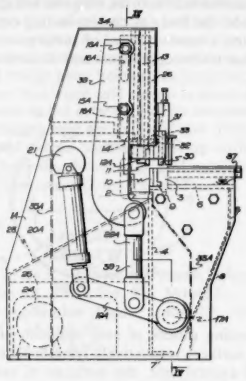
3,885,485

HYDRAULICALLY OPERATED GUILLOTINE

Frederick Ralph Savory, Sutton-in-Ashfield, England, assignor to Steel Construction & Engineering Co. (Notts.) Limited, Sutton-in-Ashfield, England

Filed Jan. 21, 1974, Ser. No. 434,949
Claims priority, application United Kingdom, Jan. 26, 1973, 4045/73
Int. Cl. B26d *5/08*
U.S. Cl. 83—625 **7 Claims**

1. A hydraulically operated guillotine comprising side-frames with guides for a movable blade-carrying beam, projections on the ends of the blade-carrying beam projecting through slots in the side-frames extending in the direction of movement of the blade-carrying beam, a shaft extending through journals in the side frames with its axis parallel to the central plane of the slots in the side-frames, a pair of arms rigidly secured one to each end of the shaft and extending transversely with respect to the central plane of the slots in the side-frames, a pair of hydraulic rams secured one between each arm on the shaft and an anchorage on the respective side-frame, and linkages from positions on the arms intermediate the shaft and the rams to the projections on the ends of the blade-carrying beam, wherein each linkage comprises a bar extending rigidly from the projections at one end of the blade-



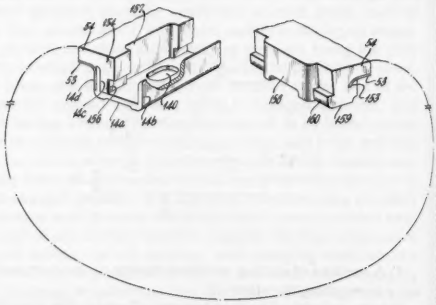
carrying beam and a link pivotally connected at one end to the arm from the shaft and pivotally connected at the other end to the bar.

3,885,486

CYLINDER COVER FASTENING DEVICES

Alan D. Kirkpatrick, 5 Warren Pl., Newfoundland, N.J. 07435, and Ronald T. Warll, 334 High Crest Dr., Butler, N.J. 07405

Continuation-in-part of Ser. No. 184,348, Sept. 28, 1971, Pat. No. 3,765,329. This application Jan. 5, 1973, Ser. No. 321,456The portion of the term of this patent subsequent to Oct. 16, 1990, has been disclaimed.
Int. Cl. B26d *7/20*
U.S. Cl. 83—659 **5 Claims**



1. A fastening device for releasably securing a split ring annular member around a rotary die cutting machine cylinder body comprising:
a non-elastically deformable mounting member and a fastening element coextensive in length, said mounting member adapted to fit within a slot provided in a cylinder and being generally of U-shaped cross section, and said mounting member including a longitudinal flange of an elastically deformable material partially restricting the opening of said mounting member and extending partially into said mounting member, said fastening element including a projection for cooperative engagement with said mounting member flange when in a fastened position, said fastening element being of an elastically deformable material, whereby said fastening element will conform to said mounting member sufficiently to be

retained thereby when in operative engagement but permit forceable separation of said fastening element and mounting member;

means for attaching said fastening element to one end of said split ring member; and

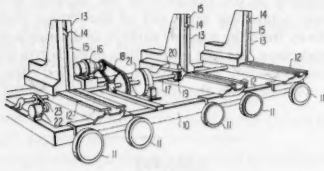
means for attaching said mounting member to the opposite end of said split ring member.

3,885,487

SETWORKS CONTROL FOR SAWMILL

Clement Walker Weston, Jr., 4819 Baudin St., New Orleans, La. 70150

Filed Feb. 25, 1974, Ser. No. 445,142
Int. Cl. B27b *29/10*
U.S. Cl. 83—728 **20 Claims**



1. An electronically controlled setworks for automatically positioning the head blocks of a sawmill, comprising, in combination:

prime mover means coupled to the head blocks of a sawmill carriage for selectively advancing and retracting the head blocks in response to command signals applied to said prime mover means;

means coupled to said prime mover means for providing a DC output signal which is a function of the linear velocity of said head blocks on said carriage;

electrical signal integrator circuit means coupled to said DC output signal means and being responsive to the output thereof for a predetermined time to provide a DC output signal the magnitude of which is proportional to the distance said head blocks move on said carriage;

selector circuit means providing a plurality of first DC output signals, each of which has a magnitude calibrated to the desired plurality of widths of cut by said sawmill;

comparator circuit means coupled to the output signal from said integrator circuit means and a selected first DC output signal from said selector circuit means and providing a control output signal when said DC output signal equals said selected first DC output signal; and

first circuit means responsive to said control output signal coupled between said comparator circuit means and said prime mover means, applying a first command signal to said prime mover means to stop advancement of said head blocks in response to said control output signal.

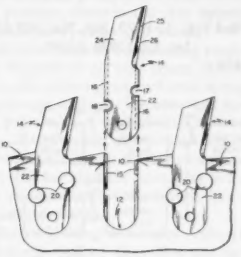
3,885,488

TAPERED CAST TOOTH INSERT FOR SAW

Ernest A. Evancic, Fitchburg, Mass.; Kenneth E. Davis, Winter Park, Fla., and Joseph T. Blucher, Waltham, Mass., assignors to Wallace Murray Corporation, Fitchburg, Mass.

Filed Jan. 7, 1974, Ser. No. 431,231
Int. Cl. B27b *33/12;* **A01d** *55/18*
U.S. Cl. 83—835 **2 Claims**

1. A tooth insert for a saw, said insert having a solid flat cast metal shank portion having substantially uniform thickness and a blade portion cast in one piece with said shank portion, said blade portion having a maximum thickness no greater than the thickness of said shank portion and decreasing in thickness symmetrically from the shank portion to the tip end of the insert and a sharpened cutting edge formed by a symmetrical double bevel extending along the front edge of said blade portion.

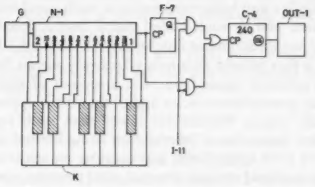


3,885,489

ELECTRONIC MUSICAL INSTRUMENT HAVING KEYBOARDS

Fumi Sasaki, Hanamaki, Japan, assignor to Kenju Sangyo Kabushiki Kaisha, Hanamaki, Japan

Filed Mar. 14, 1973, Ser. No. 341,068
Int. Cl. G10h *5/06*
U.S. Cl. 84—1.01 **10 Claims**



1. An electronic musical instrument having a circuit means comprising:

a pulse train generating means producing a pulse train having variable periodic or average pulse periods;

a first keyboard having a plurality of keys corresponding to the notes of do, re, mi, fa, sol, la, and ti;

a second keyboard having a plurality of keys corresponding to the keys A, B, C, D, E, F and G;

a first circuit arrangement connected to said first keyboard for absorbing or pulling out a pulse of said pulse train in response to the depression of a key of said first keyboard; a second circuit arrangement connected to said second keyboard, for modulating the periodic vibrations or average pulse periods of said pulse train in response to the depression of a key of said second keyboard;

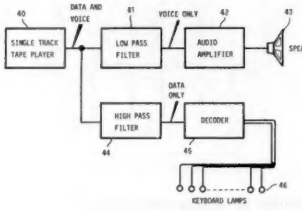
cycle counter means for producing a waveform, including a first cycle counter for counting the pulses absorbed or pulled out by said first circuit arrangement, and for returning to reset after a predetermined number of input pulses have been counted; and

output means connected to said cycle counter means for amplifying and converting waveform into sound, said output means including code converter means for converting the counted number of pulses counted by said cycle counter, into codes, a first digital-analog converter means for convering said codes into analog voltage and analog-tsound converter means for converting said analog voltage into sounds.

3,885,490
SINGLE TRACK SIGHT AND SOUND MUSICAL INSTRUMENT INSTRUCTION DEVICE

Cecil F. Gullickson, 2018 Fosgate Dr., Winter Park, Fla. 32789

Filed Feb. 1, 1973, Ser. No. 328,657
Int. Cl. G09b *15/00*
U.S. Cl. 84—470 2 Claims



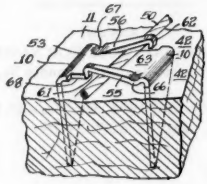
1. A sight and sound instructional device for a musical instrument, comprising a plurality of illumination means adjacent the portions of the instrument to be contacted by the fingers of the player, control means operatively connected to said plurality of illumination means, a single track tape playing device arranged for playing a pre-recorded magnetic tape containing coded instructional information and aural instructional information both recorded on a single track on said magnetic tape, such coded instructional information and aural instructional information being superimposed on such single track, separation means connected to the output of said tape playing device and being responsive to such aural instructional information and to such coded visual instructional information, said separation means including two-channel filter means wherein a first of said channels effectively passes frequencies below a selected upper limit, and a second of said channels effectively passes frequencies higher than such upper limit and effectively rejects frequencies lower than such upper limit, said coded instructional information being limited to frequencies above such upper limit, and decoder means connected to the output of said second channel, said decoder means being responsive to modulated segments of a sinusoidal carrier wave, said carrier wave having a frequency higher than such selected upper limit, said decoder means having input means such that said decoder means responds to pre-recorded information supplied thereto, where such pre-recorded information is modulated segments of said sinusoidal carrier wave, said decoder means operatively connected to said control means, thereby selectively causing the illumination of said plurality of illumination means singly and in various combinations and sequences for instruction of the player as determined by such instructional information, and simultaneously providing aural instruction to the player related to such illumination.

3,885,491
LOCKING STAPLE

Gary Martin Curtis, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 21, 1973, Ser. No. 427,237
Int. Cl. F16b *15/00, 39/24*
U.S. Cl. 85—49 3 Claims

1. A one-piece generally U-shaped staple device for the attachment of wires or the like to a support surface, the staple device including a pair of legs extending in a first direction each having workpiece penetrating points and a planar bridge portion interconnecting said pair of legs and providing an impact driving surface for the staple device, a pair of arms formed integrally to the staple extending between the legs, each arm having a free end and said free ends being disposed adjacent opposing extremities of the bridge, the arms being generally planar and generally positioned in the plane of the bridge, crimped surfaces forming arm rotating means on the arms extending downwardly in said first direction from the plane of the arms and the bridge and located intermediate the free extremity and the point of connection of the arm with the staple thereby adapted to engage the support surface prior to

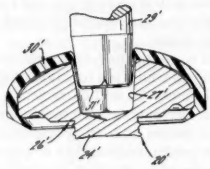


the engagement of the bridge with the support surface to progressively rotate the arms out of the bridge plane in a direction away from the support surface as the staple is driven into the workpiece, the free extremities of each arm including hook means extending downwardly in said first direction to retain the wire beneath the arms and on top of the bridge surface.

3,885,492
CAPPED FASTENER

Charles E. Gutshall, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Filed Nov. 16, 1973, Ser. No. 416,374
Int. Cl.[2] A47G *3/00*; F16B *15/02*
U.S. Cl. 85—53 9 Claims

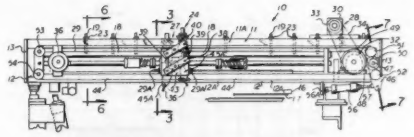


1. A fastener adapted to be tightened in a member by a driver including a threaded shank, a head integrally formed with one end of said shank and having a driver recess formed therein, means connected to the underside of said head and projecting in a generally axial direction away from said head for engagement with the member to space the underside of said head from the member when said fastener is secured in the member, and a cap formed of a resilient, synthetic resinous material mounted on said head, said cap including an upper side of predetermined thickness, a peripheral skirt integrally formed with and depending from said upper side along the sides of said head, an annular lip integrally formed with and extending radially inwardly from the lower margin of said skirt along the underside of said head to hold said cap on said head, said lip having a thickness greater than the distance said means spaces the underside of said head away from the member so the lip is compressed and clamped tightly against the member by the head when said fastener is secured in the member, and means including a resiliently yieldable central web integrally formed in said upper side and normally disposed across said recess and covering the latter for resilient flexure into said recess as the driver is mated with said recess for turning said fastener said web being substantially thinner than said predetermined thickness of said upper side and resiliently moving outwardly of said recess and toward its original shape to again cover the recess as said driver is withdrawn therefrom.

3,885,493
PRINTING HEAD CONSTRUCTION FOR USE IN A SCREEN PRINTING MACHINE

David Jaffa, Fairlawn, N.J., assignor to Precision Screen Machines, Inc., Hawthorne, N.J.

Filed Apr. 3, 1973, Ser. No. 347,383
Int. Cl. B41f 15/42
U.S. Cl. 101—123 8 Claims

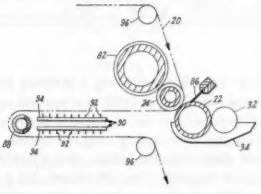


1. A screen printing head for use with a screen printing machine having a printing surface for supporting thereon a material to be screen printed comprising:
a printing head frame having opposed longitudinally extending rigid support members,
a guide rail on each said support member,
support means for supporting said guide rail on each of said rigid support members,
a squeegee carriage slidably mounted on said guide rails for traversing a printing stroke,
a squeegee carried on said squeegee carriage,
and said support means including means for adjusting the spacing between each said guide rail and the printing surface so that the pressure exerted by said squeegee is maintained substantially constant as said squeegee carriage traverses a printing stroke,
said support means including a plurality of adjusting rods located at spaced intervals along said rigid members for supporting said guide rail from each said rigid support member,
said adjusting rods each having a threaded portion,
and an adjusting nut engaging said threaded portion whereby the adjustment of said nut on said adjusting rod adjusts each said guide rail relative to said printing surface.

3,885,494
PRINT MACHINE AND METHOD

Johann Heinrich Saueressig, Wuellen, Ahaus, Germany, assignor to Saueressig GmbH, Wuellen, Ahaus, Germany

Continuation-in-part of Ser. No. 210,064, Dec. 20, 1971, Pat. No. 3,738,265, which is a continuation-in-part of Ser. No. 23,564, March 30, 1970, abandoned. This application Mar. 29, 1973, Ser. No. 345,873
Claims priority, application Germany, Apr. 29, 1969, 1916359The portion of the term of this patent subsequent to June 12, 1990, has been disclaimed.
Int. Cl. B41f 9/02
U.S. Cl. 101—181 22 Claims

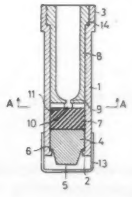


1. A print machine for the continuous printing of a continuous web traveling therethrough comprising:
a. a machine frame;
b. a vertical gate member pivotally mounted at least on one side thereof on said frame for pivotal movement about a vertical axis at said pivoted side from a closed position to an open position wherein the side opposite the pivotal axis is spaced away from said frame;
c. a multiplicity of pairs of cooperating print and press rolls rotatably supported on said frame in vertically spaced alignment, the print roll of each pair being disposed outwardly adjacent said gate member and having a circumferential pattern of a multiplicity of measuring indicia about its circumference adjacent an end thereof dividing the circumference into a multiplicity of measuring units, said print rolls having their axes lying in a common vertical plane and said press rolls having their axes lying in a parallel vertical plane;
d. a multiplicity of inking units supported on said gate member in vertically spaced alignment and each cooperating with one of said print rolls for applying a coating of ink to the circumferential surface of an associated print roll as it rotates during operation of the machine, each inking unit including an ink trough, an inking roll and means for moving said ink trough relative to said print rolls;
e. a plurality of path deflecting means on said machine frame each including a support member on said frame spaced inwardly of said press rolls relative to said gate member whereby the web issuing from the nip of one pair of rolls is directed inwardly of the machine about said support member and thence outwardly into the nip of the next adjacent pair of rolls along the path of web travel;
f. a plurality of pitch adjustment means each including an alignment element cooperating with the said measuring indicia of one of said print rolls and means for independently rotating each of a plurality of the print rolls to effect registry of a preselected measuring indicium with said alignment element;
g. drive means for rotating said print and press rolls; and
h. an auxiliary drive roll for the web and means for driving said auxiliary drive roll.

3,885,495
STAMPING DEVICE

Takaji Funahashi, 1, Kitatakasho-machi 2-chome, Nishi-ku, Nagoya, Japan

Continuation of Ser. No. 283,543, Aug. 24, 1972, abandoned. This application Feb. 19, 1974, Ser. No. 443,764
Int. Cl. B41f 31/00
U.S. Cl. 101—327 2 Claims



1. A stamping device adapted for continuous and high speed operation comprising:
a cylindrical outer frame open at upper and lower ends, and having an inwardly directed flange at its lower end, and an annular shoulder on its upper end on the interior thereof;
a generally mating inner frame received in said outer frame and defining a hollow cavity therein for receiving and holding ink, said inner frame having an open upper end for receiving ink therethrough, and an annular shoulder on its upper outer wall which is complimentarily shaped to said annular shoulder on said outer frame, and a transverse bottom wall provided with an inwardly and down-

wardly inclined inner surface defining the bottom of said hollow cavity;

aperture means opening through said groove means on the face of said inner surface communicating with said aperture means;

ink storage means formed of porous materials and received adjacent to said aperture means for storing ink;

stamping means formed of porous material and disposed beneath said ink storage means, supported on said flange of said outer frame, and having an exposed face projecting downwardly below the under surface of said flange of said outer frame and adapted to be wetted by ink from said ink storage means; and,

wherein said outer frame includes an outer annular shoulder adjacent to said inner annular shoulder on the exterior thereof, said outer annular shoulder providing means for connecting said device with a stamping machine.

3,885,496

DEVICE FOR APPLYING INK TO THE INKING ROLLER OF AN OFFSET PRINTING PRESS

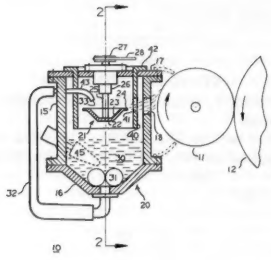
Peter Breitweg, Offenbach-Rumpenheim; Karl-Heinz Franz, Hanau am Main; Peter Mayer, Muhlheim am Main, and Klaus Wolf, Neu-Isenburg, all of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher, Germany

Filed Aug. 22, 1973, Ser. No. 390,520

Claims priority, application Germany, Aug. 22, 1972, 2241281

Int. Cl. B41f *1/40, 31/28*

U.S. Cl. 101—363 **5 Claims**



1. In an inking device for supplying a film of ink to a printing cylinder in a printing press comprising, in combination, an ink roller, a frame, a cup-like disc horizontally oriented and journaled in the frame, the disc having a peripheral lip, means for continuously depositing ink on the disc, means for rotating the disc at high speed so that the ink deposited thereon flows in a thin layer to the lip of the disc and is ejected radially outwardly therefrom by centrifugal force in a finely divided spray, a shield mounted on the frame and spaced outwardly from the disc to surround the same and having an opening at the bottom, the shield having an aperture adjacent the ink roller, and scraper blade means engaging the lip of the disc in the region remote from the aperture to prevent ejection of ink from the lip in the form of spray in the region of the scraper means while permitting ejection of ink spray in the region of the aperture and onto the surface of the ink roller.

3,885,497

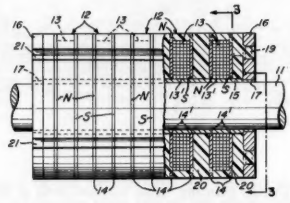
MAGNETIC PRINTING BASE AND METHOD OF MAKING SAME

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Incorporated, Dayton, Ohio

Filed Nov. 9, 1970, Ser. No. 87,673

Int. Cl. B41f *27/00*

U.S. Cl. 101—382 MV **18 Claims**



1. Method of making a printing base for mounting a printing plate, comprising the steps of: providing a cylindrical member, placing at least two magnetic circuit means on said cylindrical member, each circuit means including annular magnet means disposed between a pair of annular magnetizable plates, said plates having a greater diameter than said magnet means, placing said cylindrical member with said magnetic circuit means in a mold, flowing non-magnetic moldable material between the plates of adjacent magnetic circuit means, between the plates of each magnetic circuit means around the associated magnet means, and beyond the final desired diameter of the base, and trimming off the portions of all the plates and non-magnetic material beyond to the final desired diameter.

3,885,498

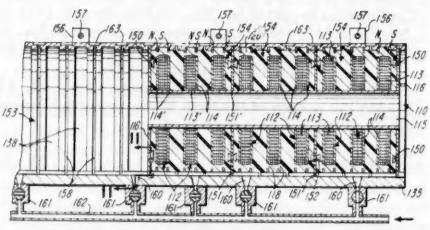
MAGNETIC PRINTING BASE AND METHOD OF MAKING SAME

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 87,673, Nov. 9, 1970. This application Mar. 6, 1974, Ser. No. 448,774

Int. Cl. B41f *27/02*

U.S. Cl. 101—382 MV **16 Claims**

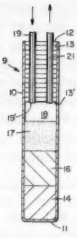


1. A magnetic base for mounting a printing plate, comprising: an elongated member, at least two spaced-apart magnetic circuit means disposed on the elongated member, each magnetic circuit means comprising magnet means disposed between a pair of magnetizable plates, and a partition disposed between adjacent magnetic circuit means, the partition being imperforate and having keying means, the partition serving to facilitate molding of the base in sections and serving when the moldable material has hardened to key the molded sections together.

3,885,499
THERMAL DETONATION ENERGY-INITIATABLE BLASTING CAPS, AND DETONATION SYSTEM AND METHOD

Eldon K. Hurley, Kenvil, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 20, 1973, Ser. No. 426,979
Int. Cl. F42d *1/04;* **F42b** *3/10*
U.S. Cl. 102—23 **17 Claims**

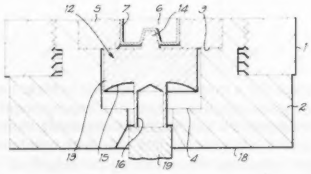


1. A nonelectrically initiated blasting cap which comprises a closed shell; an initiator charge in said shell ignitable in response to action of thermal detonation energy of an explosive gas mixture and said shell containing an open space adjacent said initiator charge; a first conduit means extending from outside said shell into said open space in direct open communication with said initiator charge so as to convey an explosive gas mixture as a confined stream into detonating position in said open space for responsive ignition of said initiator charge; a second conduit means permitting said open space to be purged of gases other than said explosive gas mixture prior to detonation of said confined stream for said responsive ignition extending from said open space to the outside of said shell, whereby a stream of said explosive gas can be continuously passed from said first conduit means through said open space and through said second conduit means to purge said open space as described and thereafter explosive gas in said first conduit means can be detonated for propagation of resulting thermal detonation energy to said open space for ignition of said ignition charge.

3,885,500
PERCUSSION IGNITER FOR PROJECTILES AND PROJECTILE EMBODYING THE SAME

Robert M. Bornand, Meyrin, Switzerland, assignor to Valinor Anstalt, Vaduz, Liechtenstein

Filed Oct. 16, 1973, Ser. No. 406,930
Claims priority, application Switzerland, Oct. 5, 1973, 14241/73
Int. Cl. F42c *1/00*
U.S. Cl. 102—45 **5 Claims**

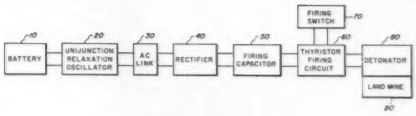


1. In a percussion igniter for projectiles, comprising an igniter body, a primer within said igniter body, a striker disposed in said igniter body for movement toward and away from said primer, said body having an annular internal shoulder thereon that surrounds an opening through the bottom of said primer to provide access to said striker, said body and primer and striker and shoulder being coaxial; the improvement in which said striker has a concave surface confronting said annular shoulder whereby upon combustion of said primer, said striker is forced against said annular shoulder to flatten out said concave surface against said annular shoulder thereby to seal against the escape of gas under pressure through said opening.

3,885,501
FAIL-SAFE ELECTRICAL TIMER

Clayton J. Schneider, Jr., East Aurora, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,723
Int. Cl. F42c *7/02;* **F42b** *23/26*
U.S. Cl. 102—70.2 R **5 Claims**



1. A fail-safe electrical timer which will become deactivated after a preselected time and upon the intervening failure of a component including:

power means;

oscillator means driven by said power means and producing an AC output;

rectifier means for rectifying said AC output;

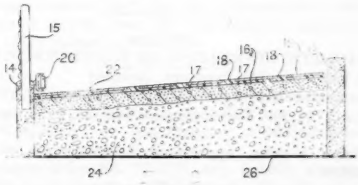
firing capacitor means charged by said rectifier means;

thyristor firing circuit means including a normally open firing switch and a detonator connected to said firing capacitor means whereby upon the closing of said firing switch the said firing capacitor means is allowed to discharge through and thereby activate said detonator.

3,885,502
ENTERTAINMENT VEHICLE RIDE

Jay Sarno; Jon Daugherty, both of Las Vegas, Nev., and Carl Schneidinger, Rolling Hills Estates, Calif., assignors to Sarno International Speedways, Inc., Las Vegas, Nev.

Filed May 9, 1974, Ser. No. 468,430
Int. Cl. A63h *18/12*
U.S. Cl. 104—53 **7 Claims**



1. A closed loop track for amusement type electrically powered vehicles, comprising: A concrete support base extending under the entire surface area of the track, the upper surface thereof being in the desired configuration of a track surface; a thick plastic insulating coating deposited on and entirely covering the upper surface of the concrete support base; a plurality of spaced substantially parallel electrical conductor strips embedded in the insulating coating and presenting an exposed upper surface for electrical engagement, the insulating coating electrically isolating the strips from each other; the conductor strips each being electrically connected to a power supply.

3,885,503

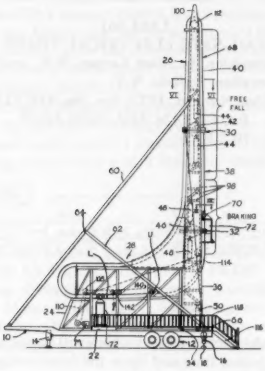
AMUSEMENT RIDE

Gerald L. Barber, 309 Cardinal Dr., Taylors, S.C. 29687

Filed Apr. 24, 1974, Ser. No. 463,445

Int. Cl. A63g *1/08*

U.S. Cl. 104—76 **17 Claims**



1. In an amusement ride; endless track means in the form of a loop comprising a vertical portion and a horizontal portion extending laterally from the bottom of the vertical portion, a carriage having a passenger compartment suspended therefrom and captive on the track means for movement in one direction therearound, first conveyor means operable to engage the carriage in a first predetermined position on said horizontal position and to move the carriage to the top of said vertical portion and to release the carriage thereat for free fall along the vertical portion, cooperating brake elements on said carriage and on said vertical portion near the bottom thereof forming first brake means for braking said carriage, second conveyor means operable to engage and move the carriage out the bottom of the first brake means for movement to a second predetermined position on said horizontal portion, second brake means for arresting the carriage in said second predetermined position, and selectively operable means for moving said carriage from said second predetermined position toward said first predetermined position, all movements of said carriage being in said one direction around said endless track means.

3,885,504

MAGNETIC STABILIZING OR SUSPENSION SYSTEM

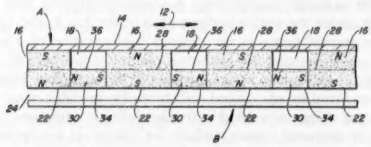
Max Baermann, 506 Bensburg, Germany

Continuation-in-part of Ser. No. 181,523, Sept. 17, 1971, Pat. No. 3,791,309. This application May 25, 1973, Ser. No. 363,988

Claims priority, application Germany, Jan. 9, 1971, 2100839

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **20 Claims**



1. In an arrangement for maintaining a vehicle in spaced relationship to an elongated support over which said vehicle moves in a predetermined direction said support including conductor means of non-magnetic material, the improvement which comprises; a plurality of small permanent magnets movable with said vehicle and spaced-apart in said predetermined direction a distance approximately equal to one half of their length in said direction, each of said magnets having opposite north and south poles and an axis of magnetization perpendicular to said support, alternate ones of said magnets being reversely positioned so that said magnets present alternate north and south poles facing said support, and a magnetically permeable member in engagement with the ends of said magnets remote from said support and bridging the spaces therebetween, said magnets having magnetic flux extending into said conductor means between adjacent poles of said magnets, whereby movement of said magnets with said vehicle in said predetermined direction relative to said conductor means produces eddy currents in said conductor means which establish magnetic fields opposite to the magnetic fields of said magnets and said fields repulse one another.

3,885,505

TRACK FOR MAGNETIC-SUSPENSION VEHICLE

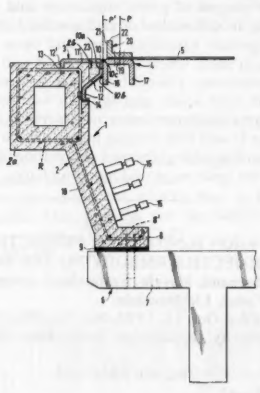
Gunther Winkle, Munich; Peter Molzer, Hebertshausen; Peter H. Otto, and Rudolf Zurek, both of Munich, all of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Jan. 18, 1974, Ser. No. 434,572

Claims priority, application Germany, Jan. 25, 1973, 2303515

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 LM **8 Claims**

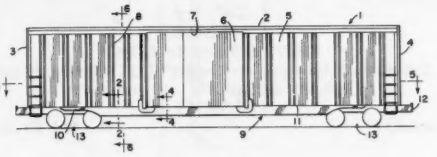


1. In a track for a magnetic suspension vehicle having suspension and guide electromagnets, the improvement wherein said track comprises a longitudinally extending beam of reinforced concrete, a connecting rail rigid with said beam and at least in part imbedded therein along the length of said connecting rail, and an armature of U-profile extending along and connected to said connecting rail, said armature being adapted to cooperate with said electromagnets, said connecting rail having a hollow profile defining a base leg and a pair of lateral legs, said lateral legs having free edges remote from said base leg and imbedded in the concrete of said beam, said armature having a lateral shank rigidly connected to said base leg.

3,885,506
RAILROAD CAR WITH DEPRESSED FLOOR

William D. Mundinger, Canfield, Ohio, and Richard C. Snyder, Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Apr. 8, 1974, Ser. No. 458,741
Int. Cl. B61d *17/00*
U.S. Cl. 105—367 22 Claims

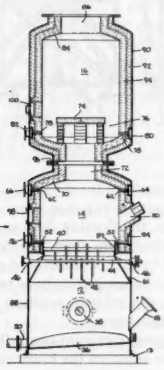


1. A railroad car for high cubic capacity interior design including a recessed floor construction and comprising:
a pair of side sills,
a center sill structure spaced between the side sills,
said floor construction including a floor structure having a pair of recessed floor units, one on either side of and extending substantially below the top of the center sill structure and inwardly of a respective side sill, and
said floor structure having a longitudinal recess portion between each floor unit and its adjacent side sill and a removable filler within said recess portion.

3,885,507
INCINERATOR SYSTEMS

Thomas E. Davy, Newark, and Gerald E. Marquess, Matawan, both of N.J., assignors to Nichols Engineering & Research Corporation, New York, N.Y.

Filed Oct. 6, 1972, Ser. No. 295,535
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 R 12 Claims



8. An incinerator system comprising an incinerator member having a lower tank portion, a medial ignition chamber mounted in fluid flow communication with said tank portion, and an upper combustion chamber mounted in fluid flow communication with said ignition chamber, said lower tank having an inlet for receiving a continuous flow of oleaginous floatable materials contained in a liquid, said tank having an oulet, means for controlling the liquid level in said tank, ignition burners mounted on the wall of said ignition chamber, means for supplying air to support combustion in said igntion chamber, a connecting passage interconnecting said ignition chamber with said combustion chamber, a baffle mounted on the bottom of said combustion chamber encompassing the upper end of said connecting passage to direct the products of combustion entering the combustion chamber in a radial flow pattern, said baffle forming an annular passage in the bottom of said combustion chamber, combustion air jets mounted around the periphery of said combustion chamber to direct air into said annular passage.

3,885,508
FOOD CASING AND METHOD OF MAKING IT

Richard E. Hofmann, 504 Wimer Cir., and Francis R. Walters, 8494 Lincoln Blvd., both of Pittsburgh, Pa. 15237

Continuation-in-part of Ser. No. 343,366, March 21, 1973.
This application Jan. 17, 1974, Ser. No. 434,032
Int. Cl. D05b *1/08*, *93/00*
U.S. Cl. 112—262 11 Claims

1. A method of making a relatively thin-wall hollow food-receiving casing from a relatively flat length of non-woven paperlike material whose fibers extend substantially crosswise of its length which comprises, folding-over a length of the material to provide a pattern piece having a fold-closed longitudinal side, an opposed longitudinal side having a pair of open edges, and open upper and lower ends; double folding-over a central bottom end portion of the folded-over piece to provide a four-thickness portion, cutting the folded-over pattern piece at its lower end into a convexly rounded shape about the four-thickness portion, applying a longitudinally advancing and cross-looped edge-overlapping multi-thread stitching of thread along edge portions of the closed and open longitudinal sides and along the rounded lower end of the pattern piece to provide a closed-off stitching-reinforced casing having an open upper end for stuffing a food product therein, and controlling the stitching operation to assure a close engagement of the thread with hole portions formed in the material at least about the four-thickness rounded end portion of the pattern piece.

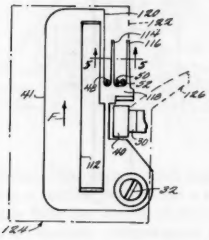
3,885,509
OVEREDGE SEAMING

Roy B. Cox, High Point, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 169,035, Aug. 4, 1971, abandoned.
This application Sept. 27, 1973, Ser. No. 401,417
Int. Cl. D05b *1/22*
U.S. Cl. 112—441 5 Claims

1. In a sewing machine for overedge stitching of a plurality of layers of material in a manner such that the layers can be hinged about a common axis to form a relatively flat seam, said machine being of the type having means for feeding a plural layered workpiece past a seaming area on a throat plate, a needle carrier mounting two curved needles and adapted to reciprocate the curved needles in arcuate paths through the throat plate and through the superimposed layers of material along two different lines parallel to and spaced from the edge of the layers of material, a looper mechanism for cooperating with both needle threads to effect overedge stitches, said

looper mechanism including an upper looper arm and a lower looper arm, said looper arms being driven by cam cylinders having endless cam grooves, a trimming mechanism disposed in advance of the seaming area for trimming off the edge of superimposed layers of material along a straight trim line just prior to arrival of the superimposed layers at the seaming area, and a drive mechansim for driving the needle carrier and looper arms in synchronization, the improvement comprising an auxiliary needle carried by the needle carrier in a position transversely spaced from the aforesaid needles with respect to the direction of feed such that the third needle moves in a path substantially coextensive with the trim line and through the raw edges of the freshly trimmed material, said looper arms cooperating with the thread carried by said auxiliary needle in the same manner as with the thread carried by the first-mentioned needles to form an overedge stitch.



3. A method of overedge seaming a plurality of layers of work material comprising: superimposing the edge portions of the layers trimming off a thin strip of the superimposed layers, passing first and second continuous needle threads through the work material at points spaced along two parallel lines which are parallel to and spaced from the trimmed edge of the work material to form first and second rows of needle thread loops in the material, simultaneously passing a third thread through the raw, freshly trimmed edge of the work material to form a third series of loops, manipulating a looper thread to be interlooped with all three series of loops to form overedge stitches of the type which permit the layers of the work material to be rotated relative to each other about a common axis to bring the edges of the layers into generally abutting relationship, and rotating layers about said common axis to bring the edges into generally abutting relationship whereby the resulting seam is smooth and flat and free from holes.

3,885,510
METHOD AND APPARATUS FOR CREATING A SUB-ATMOSPHERIC PRESSURE INSIDE CLOSED CONTAINERS

Ivo Hauser, Vevey, and Werner Hiltbrunner, Berne, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

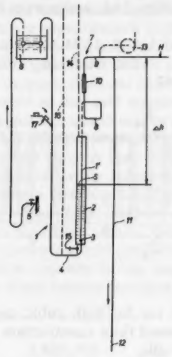
Continuation-in-part of Ser. No. 240,956, April 4, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 449,149

Claims priority, application Germany, Apr. 14, 1971, 2118137

Int. Cl. B21d *51/26*

U.S. Cl. 113—1 G **8 Claims**

1. Apparatus for creating a sub-atmospheric pressure inside closed containers filled and/or sealed at atmospheric pressure, comprising a duct full of liquid with an inlet and an outlet, a supply of liquid, said liquid moving from the inlet to the outlet, part of said liquid in the duct being at atmospheric pressure,



a section of said duct being a barometric leg, being placed higher than the part of the liquid at atmospheric pressure.

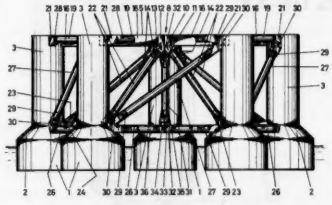
3,885,511
FLOAT DRILLING PLATFORM OR SIMILAR FLOATING STRUCTURE

Johannes Wipkink, Sassenheim; Marinus Van Holst, and Johan Gerhard Wolters, both of Maassluis, all of Netherlands, assignors to Ingenieursbureau Marcon (Marine Consultants) B.V. and Scheepsbouwbelangen B.V., both of The Hague, Netherlands

Filed Apr. 21, 1972, Ser. No. 246,371

Int. Cl. B63b *35/00*

U.S. Cl. 114—.5 D **7 Claims**



1. In a floating platform for the open sea of the type including a number of vertical columns carried by floating devices at their lower ends, the floating devices having a larger horizontal cross-sectional area than the columns, a horizontal work deck carried by said columns, and a plurality of horizontal and/or inclined bracing members between adjacent columns to maintain the relative position of the columns, the improvement comprising:

a. a first bracing member joint centrally located between all of the columns adjacent the lower surface of the horizontal work deck,

b. a second bracing member joint substantially vertically below said first bracing member joint,

c. a plurality of bracing members emanating from said first bracing member joint to upper and lower points on said columns, wherein the bracing members between the first bracing member joint and the upper points on said columns lie in on plane, the first bracing member joint having a central core member having a polyhedral shape with the number of faces corresponding to the number of bracing members leading to said joint, a first connecting portion protruding horizontally from said core member, the number corresponding to the number of bracing

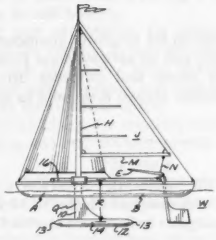
members extending from said joint to said lower points on said columns, and third connecting portions extending downwardly toward said second bracing member joint, and

d. a plurality of bracing members emanating from said second bracing member joint only to lower points on said columns, and to said first joint.

3,885,512
CATAMARAN STRUCTURE

Paul M. Marcil, 12117 Phillips Ave., Lynwood, Calif. 90262

Filed July 15, 1974, Ser. No. 488,589
Int. Cl. B63h 9/00
U.S. Cl. 114—39 **3 Claims**



1. In a catamaran that includes a pair of laterally spaced parallel pontoons, a plurality of spaced cross pieces secured to said pontoons to maintain them in a fixed spaced relationship, a mast having a first end, a sail supported from said mast, a rudder pivotally supported in a fixed position relative to said pontoons, a support for a user of said catamaran intermediately disposed between said pontoons, the improvement for so supporting said mast and sail that said pontoons, support and cross pieces remain substantially horizontal when said catamaran is wind propelled, said improvement comprising:

a. a rigid elongate member secured to said cross-pieces and normally disposed thereto, said member of circular transverse cross section;

b. a pair of longitudinally spaced collars adjustably secured to said rigid member;

c. a tubular sleeve pivotally supported from said elongate member and disposed between said collars;

d. first means for rigidly connecting said first end of said mast to said sleeve for said mast to extend upwardly therefrom; and

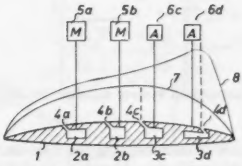
e. a keel weight

f. a rigid downwardly extending keel member that has first and second ends, said first end of said keel member secured to said sleeve and said second end to said keel weight, with the magnitude of said keel weight and the distance between said first and second ends of said keel member being so related to the height of said mast and the area of said sail that said mast and sail will pivot downwardly and outwardly and said keel member and keel weight upwardly and outwardly as said catamaran is subjected to wind without said pontoons crosspieces and support being appreciably displaced from a horizontal position.

3,885,513
AUTOMATIC MECHANISM FOR PREVENTING CAVITATION AT AIR FED HYDROFOILS AND FLOW BODIES

Hanns Von Schertel, Hergiswil, and Otto Munch, Horw, both of Switzerland, assignors to Supramar AG, Luzern, Switzerland

Filed June 4, 1973, Ser. No. 366,795
Int. Cl. B63b 1/24
U.S. Cl. 114—66.5 H **10 Claims**

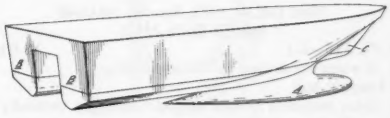


1. Automatic mechanism for preventing cavitation at hydrofoils and flow bodies supplied with air at a surface thereof from air exit openings, the improvement comprising the provision of air exit rows at those locations of greatest excess speed at the foil profile defining a flow body, said excess speed being related to the negative pressure at said foil profile, air admission valve means operatively connected to each such air exit row and controlled by the pressure in said exit row, said air admission valve means being opened by negative pressure against the action of an adjustable closing force, the closing force being of a magnitude such that each air admission valve means is opened and admits air from the atmosphere when a predetermined pressure has been reached.

3,885,514
ARRANGEMENT RELATING TO SHIP HULLS

Jan Tronje Lauenborg, Fjelltun, 1640-Raade, Norway

Filed July 31, 1973, Ser. No. 384,252
Claims priority, application Norway, Aug. 1, 1972, 2744/72
Int. Cl. B63b 1/12, 1/22
U.S. Cl. 114—66.5 R **4 Claims**

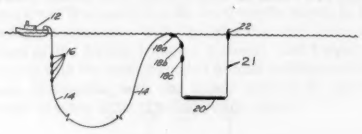


1. A ship's hull having a bow, stern, bottom and lateral sides and including two depending side portions which are spaced in opposition to one another and have free lower edges, said side portions defining at said bottom, a central longitudinal channel extending from the stern towards the bow, and a central portion disposed in said channel at the front thereof and including a downwardly projecting portion extending at a level beneath the free lower edges of said side portions and of substantially shorter length than the overall length of the hull, said downwardly projecting portion being disposed substantially in entirety below said free lower edges of the side portions and constituted as a horizontally extended torpedo-like body.

3,885,515
RIGID LINE ARRAY SUSPENSION SYSTEM

Hamlin A. Caldwell, Jr., Stonington, Conn., and Ralph R. Miller, III, Seattle, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 7, 1974, Ser. No. 477,528
Int. Cl. B63b *21/56*
U.S. Cl. 114—235 B **5 Claims**



1. An array suspension system suitable for towing in water comprising:

a tow cable;

weighting means connected near the fore end of said tow cable for adding negative buoyancy to the system;

first buoyant means adapted for being towed totally submerged underwater and further adapted for rising to the surface of the water at zero speed connected to said tow cable aft of said weighting means;

an array of negative buoyancy having forward and aft ends, said forward end connected to said tow cable a predetermined distance from said floating means to enable said forward end of said array of negative buoyancy to be suspended at a predetermined depth in water when the system is at zero speed;

a drogue system including a drogue line with a second buoyant means connected to the aft end of said drogue line, said second buoyant means adapted for being towed totally submerged underwater and further adapted for rising to the surface of the water at zero speed, said second buoyant means comprising a drogue, said drogue line having its forward end connected to said aft end of said array and said drogue line being a predetermined length to enable said array of negative buoyancy to be suspended at said predetermined depth when the array suspension system is at zero speed.

3,885,516
PROPULSION UNIT FOR A WATER-SKI TOWING DEVICE

Miroslav Uroshevich, 2505 Fleetwood Ave., Cincinnati, Ohio 45211, and Harry V. March, 7223 Gracely Dr., Cincinnati, Ohio 45233

Filed Oct. 4, 1973, Ser. No. 403,440
Int. Cl. B63b *21/56*
U.S. Cl. 115—6.1 **12 Claims**

1. A water-ski towing device comprising:

a bouyant hull;

a motor mounted in said hull and having a vertically oriented output shaft;

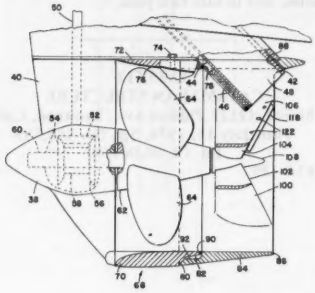
a streamlined strut extending downward through said hull, said output shaft extending through said strut;

a propeller drive unit mounted adjacent the lower end of said strut, said propeller drive unit receiving an input from said motor output and having a right angle propeller drive shaft;

a propeller mounted on said propeller drive shaft;

an annular two-piece streamlined shroud secured to said strut and comprised of abutting upstream and downstream annular sections, said annular upstream section of said shroud being positioned around said propeller closely adjacent the tips thereof whereby a propulsive annular stream is directed from said shroud in an axial direction, said annular stream having a tangential velocity component;

said annular downstream section of said shroud supporting a plurality of radial vanes in the flow path of said stream through said shroud, said vanes being angled to turn the flow in a tengential direction opposite to and at least as

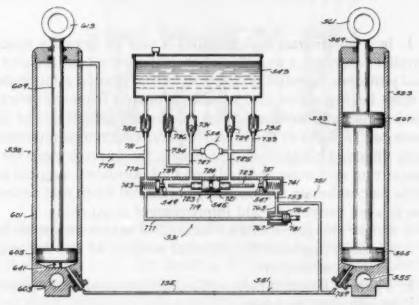


great in mangitude as the tangential component imparted by said propeller; and an anticavitation plate supported from said strut above said propeller drive unit and wherein said annular shroud is secured to said anticavitation plate.

3,885,517
POWER TRIM-TILT SYSTEM

Gaylord M. Borst, Waukegan, and Martin H. Meyer, Libertyville, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jan. 4, 1973, Ser. No. 320,913
Int. Cl. B63h *5/12*
U.S. Cl. 115—41 HT **13 Claims**

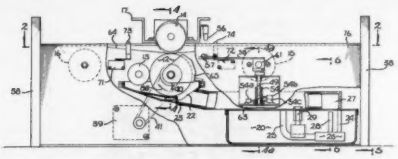


1. A marine propulsion device comprising a first member adapted to be attached to a boat, a second member, means including a tilt pin for connecting said second member to said first member for vertical swinging movement of said second member relative to said first member about said tilt pin, a first hydraulic cylinder-piston assembly connected to said first and second members at locations spaced from said tilt pin, a second hydraulic cylinder-piston assembly connected to said first and second members, said second hydraulic cylinder-piston assembly including a cylinder, a piston assembly located in said cylinder and including first and second axially spaced pistons fixedly connected to each other, a piston rod, and means connecting said piston assembly to said piston rod for limited relative movement therebetween axially of said cylinder, and hydraulic means connected to said first and second hydraulic cylinder-piston assemblies for pressurization thereof.

3,885,518
RIBBON INKING APPARATUS

Anselm F. Varni, Los Angeles, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 284,668, Aug. 29, 1972, abandoned.
This application May 28, 1974, Ser. No. 473,796
Int. Cl. B05c *1/08*
U.S. Cl. 118—6 9 Claims



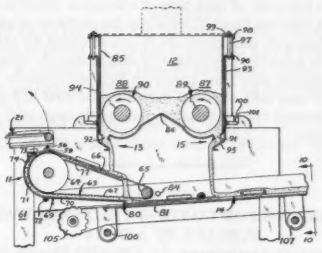
1. Apparatus for re-inking a ribbon comprising;
a housing;
a first pair of spindles for receiving a first roll mounted for rotation in said housing;
a second pair of spindles for receiving a second roll mounted for rotation in said housing, said first pair and second pair of spindles being mounted in said housing such that rolls engaging said spindles are parallel and define an intermediate space;
an elongated inking roller rotatably mounted in said housing parallel to said first and second rolls in said intermediate space;
a metering roller rotatably mounted within said housing parallel to said inking roller for metering ink onto said inking roller;
a trough disposed beneath said inking roller; an inking well coupled to said trough such that ink from said well may be transported to said trough and brought in contact with said inking roller;
a lid coupled to said housing;
a pressure roller rotatably mounted within said lid parallel to said inking roller, said roller having a first and second operating position, said first position being such that said pressure roller presses a ribbon disposed between said inking roller and said pressure roller and said second position being such that said pressure roller is spaced apart from said inking roller;
ribbon guiding means coupled to one of said spindles of said first pair of spindles including means for axially moving said spindle and a roll engaging said spindle for guiding a ribbon onto a roll engaging said first pair of spindles, said guiding means including photosensitive semiconductor means and a light, said semiconductor means being coupled to one of said spindles of said first pair of spindles and movable therewith, said light being mounted on said housing such that said ribbon may interrupt light incident on said semiconductor means when said ribbon is misaligned with respect to said rolls means responsive to said photosensitive semiconductor means to actuate said exially moving means; and
means whereby the ribbon may be driven from said first roll to said second roll and inked as it passes between said pressure roller and said inking roller.

3,885,519
APPARATUS FOR BREADING FOOD OBJECTS

Gerald J. Orlowski, Calumet Park, Ill., assignor to Korlow Corporation, Posen, Ill.

Filed June 4, 1973, Ser. No. 366,433
Int. Cl. A23g *3/20*
U.S. Cl. 118—16 6 Claims

1. Apparatus for applying particulate matter to articles of food, comprising: conveyor means conveying said articles and including a first conveyor belt having a forward run and a return run; baffle means conforming to and partially surrounding said return run of said first belt and adapted to collect some of said particulate matter, said return run of said first conveyor belt moving said material collected by said baffle means to the input end of the forward run of said first conveyor belt to provide a bed of said particulate matter for articles deposited thereon; a source of said particulate matter above said conveyor means including an accumulator bin defining first and second elongated slots spaced respectively upstream and downstream and each extending across said

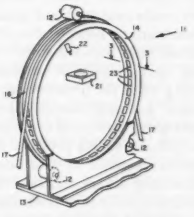


conveyor means; first and second augers rotatably mounted within said bin and located respectively above said first and second discharge slots, each of said augers conveying matter in said accumulator bin in an opposite direction relative to the direction of elongation of said slots, means for driving said augers to evenly distribute said material throughout said bin and across said slots; and means for collecting said particulate matter not adhered to said articles downstream of said first slot and returning the collected material to said bin for recirculating the same.

3,885,520
VAPOR DEPOSITION APPARATUS WITH ROTATABLE RING MASK

John F. Krumme, 87 Upenuf Rd., Woodside, Calif. 94062

Filed Mar. 8, 1974, Ser. No. 449,219
Int. Cl. C23c *13/08*
U.S. Cl. 118—49.1 7 Claims



1. In a vacuum deposition apparatus for depositing material in a stripe on an elongated substrate strip comprising:
1. a masking wheel for delimiting an area of said substrate strip upon which said material is deposited during passage of said strip through a deposition area, said wheel including:
a. a pair of axially aligned and spaced apart masking rims having generally the same outer peripheral circumferences and upon which said strip rides bridging the gap therebetween during said passage through said deposition area, and
b. a plurality of connectors extending between said rims and securing the same together at locations spaced circumferentially of said rims to normally maintain the

same a predetermined spacing apart defining said stripe;

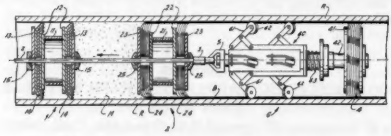
2. a source of said material to be deposited positioned inwardly of said rims whereby upon rotation of said wheel to carry said strip on said rims through said deposition area, material from said source will be deposited on the area of said strip exposed between said rims;

3. each of said connectors extending between said rims at a location between said strip and said source which is spaced inwardly of the location at which said strip bridges the gap between said rims, and said source being positioned inwardly of said rims at a location which is off the axis of rotation thereof, whereby the portions of said strip area between said rims which are shielded by said connectors from the deposition of said materials shifts along said area as said rims rotate so that all portions of said area of said strip exposed between said rims are exposed to deposited material during passage through said deposition area.

3,885,521
APPARATUS FOR COATING THE INNER WALL SURFACE OF A DUCT

Paul von Arx, Gelterkinderstr. 31, CH-4450 Sissach, Switzerland

Filed May 21, 1973, Ser. No. 362,014
Claims priority, application Switzerland, May 24, 1972, 7785/72
Int. Cl. B05c *7/06, 11/02*
U.S. Cl. 118—105 **6 Claims**



1. An apparatus for the application of a coating on the inner wall surface of a duct, comprising:

a forward and a rearward piston axially displaceable and spaced apart inside said duct and jointly with a portion of said inner wall surface forming therebetween a space for a coating mass, said forward piston having first sealing means along said inner wall surface for providing increased sealing when the pressure exerted on said coating mass increases, and said rearward piston having second sealing means along said inner wall surface which increasingly yields with increasing pressure of said coating mass and permits the issuance of said coating mass between said second sealing means and said inner wall surface;

a polishing device upstream of both said pistons;

a guide cable attached to said polishing device and passing through both said pistons;

respective means for sealing each piston against said guide cable, respectively, said polishing device pushing both said pistons and said coating mass enclosed therebetween through said duct when said guide cable is pulled;

guide means for said polishing device for inducing rotary motion thereto in said duct while said polishing device pushes said pistons through said duct;

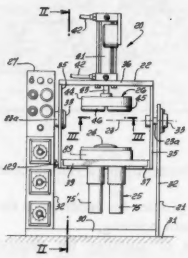
connecting means between said polishing device and said guide cable for permitting said rotary motion without substantial twisting of said guide cable, and

a swivel joint between said polishing device and said rearward piston permitting relative pivotal movement thereof while transmitting axial force from said polishing device to said rearward piston.

3,885,522
METHOD AND APPARATUS OF DECORATING A SURFACE OF AN ARTICLE

William E. MacDonald, Los Angeles, and Robert C. Harris, Jr., Glendale, both of Calif., assignors to Interpace Corporation, Los Angeles, Calif.

Filed Oct. 19, 1973, Ser. No. 408,200
Int. Cl. B05c *3/109*
U.S. Cl. 118—406 **16 Claims**



1. An apparatus for depositing a flowable thick composition material for decorative purposes on a surface of an article, comprising:

a frame structure including spaced upright standards;

an article support frame pivotally mounted on and between said spaced standards;

a removable plate on the article support frame;

a flexible elastomeric mold member fixed on said plate and including a surface generally corresponding to the surface of the article to be decorated;

said mold member having pattern defining edges forming an opening in said mold surface and having a chamber in communication with a supply of glaze composition material and said opening;

a ram carried by the article support frame in spaced relation to said mold member;

said ram having a soft yieldable pad for pressure engagement with an article aligned with said mold surface;

and operable means advancing said ram toward said mold surface and urging said soft yieldable pad carried by said ram into pressure engagement with an article and the article into tight sealing relation with the pattern defining means on said mold surface;

said operable means including means for rotating said article support frame with said mold member and ram thereon to invert the relative positions of said mold member and the article carried thereby whereby said supply of composition material is flowable into contact with the area of said surface defined by said pattern defining means;

said article support frame, mold member, and ram being rotable back to their initial positions to remove undeposited composition material from the openings on said mold member defined by said pattern defining edges.

3,885,523
SANITARY FACILITY FOR ANIMALS

Bruce A. Coleman, 201 W. 86th St., New York, N.Y. 10024

Filed July 19, 1974, Ser. No. 490,209
Int. Cl.² **A01K** *29/00*
U.S. Cl. 119—1 **14 Claims**

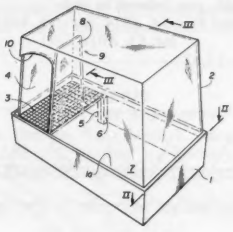
1. A sanitary facility for animals comprising:

a lower, relatively shallow tray member;

a raised horizontal screen or mesh member extending across a portion of said tray and defining an entry and exist area, the remainder of said tray defining a toilet area for receiving litter;

a top removable enclosure removably positioned over said tray, said enclosure having an entry and exit opening through at least one wall thereof, said opening extending above said screen or mesh member and being in communication with said entry and exit area of said tray; and

means for preventing litter from being tracked out of said toilet area, including a divider member partially dividing the entry and exit area of said tray from the toilet area of



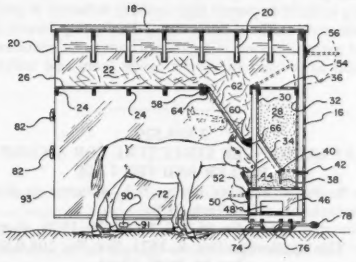
said tray and defining a passageway between said toilet area and said entry and exit area, said passageway extending above the litter and screen or mesh member and being offset relative to said opening formed in said upper enclosure member so as to define a tortuous entry and exit path for the animal over said screen or mesh member and between said opening and said passageway, whereby any litter or the like picked by the animal is caused to fall on said screen or mesh member.

3,885,524

PORTABLE LIVESTOCK FEEDER/SHELTER

Arthur B. Gregory, 101 Cypress St., West Monroe, La. 71291

Filed Dec. 7, 1973, Ser. No. 422,831
Int. Cl. A01k *1/00*
U.S. Cl. 119—16 **12 Claims**



1. A portable livestock unfloored feeder/shelter comprising a partially enclosed and unfloored upright structure mounted on underlying surface means and having opposed and spaced side wall means, end wall means having inside surface means and extending between and connected to the opposed side wall means, roof means extending between and connected to the end wall means and the opposed side wall means;

said structure having an open end for free ingress and egress of livestock and disposed between the opposed side wall means and between said roof means and the underlying surface means, the open end being arranged in opposed and spaced relation to the end wall means;

hayloft means disposed beneath said roof means and extending between and connected to the opposed side wall means, said hayloft means extending in a direction from the open end toward but spaced from the end wall means;

grain bin and feeder means mounted on the inside surface means of the end wall means and extending between and connected to the opposite side wall means;

grate means for dispensing hay from the hayloft means to livestock extending between and connected to the opposed side wall means and between and connected to said hayloft means and side grain bin and feeder means; and

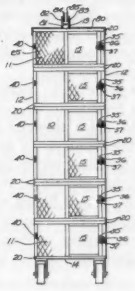
said hayloft means, said grain bin and feeder means and said grate means rigidifying said structure so as to maintain the integrity of said structure throughout normal use of said structure at a location and movement of said structure from one location to another.

3,885,525

APPARATUS AND METHOD FOR TRANSPORTING, UNLOADING AND PROCESSING LIVE POULTRY

James B. Powell, 8 Bon Haven; Beverly G. Yeiser, Robin Rd., and Joseph R. Lightner, Rt. No. 4, all of, Winchester, Ky. 40391

Division of Ser. No. 255,842, May 22, 1972, Pat. No. 3,782,398. This application Oct. 5, 1973, Ser. No. 403,805
Int. Cl. A01k *1/00*
U.S. Cl. 119—17 **6 Claims**



1. A metallic enclosure for transporting and unloading live poultry, said enclosure comprising substantially rectangular side walls and end walls and a substantially rectangular bottom wall, all said walls being formed of foraminous metal and being secured together into a unitary structure, a plurality of equally spaced, substantially horizontal floor sections secured between said top and bottom walls, said floor sections being formed of foraminous metal, a plurality of substantially vertical partitions formed of foraminous metal extending from side to side of said enclosure, a single partition of said partitions being secured between the top wall and an adjacent floor section, adjacent floor sections and between the bottom wall and an adjacent floor section, said floor sections and partitions forming tiers of superimposed compartments of equal size within said enclosure, each tier having two said compartments, access means to the interiors of each of said compartments comprising a plurality of doors formed of foraminous metal and opposed horizontal channels within which said doors are slidable horizontally between open and closed positions, said opposed channels being secured along said end walls, means abutting said doors when in closed position for locking said doors, said locking means being readily releasable by upward movement thereof, and stop means abutting said doors in open position secured to said end walls for preventing sliding movement of said doors beond fully open position.

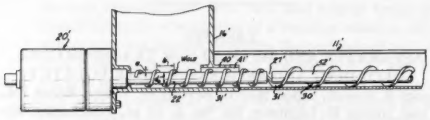
3,885,526
ANIMAL FEEDER CONSTRUCTION

Elton Sumner, 425 Brookwood Dr., Athens, Ga. 30601, and Aaron W. Adams, Jr., Douglas, Ga. 31533

Continuation-in-part of Ser. No. 72,971, Sept. 17, 1970, Pat. No. 3,636,928. This application Jan. 25, 1972, Ser. No. 220,601

Int. Cl. A01k *5/02*

U.S. Cl. 119—52 AF **7 Claims**



1. In an animal feeder construction for transporting particulate feed material,

a feed hopper for holding the feed material;

a distribution means connected to said feed hopper through which the feed material from said hopper is to be distributed;

an open cored spring-type auger having endless helical flights of a constant cross-sectional height capable of transmitting turning torque rotatably carried in said hopper and extending therefrom into said distribution means for transporting said feed material from said hopper into said distribution system, said helical flights defining a feed conveying surface thereon;

drive means for selectively rotating said auger means to distribute said feed material, said drive means including a drive shaft having a diameter a predetermined amount greater than the diameter of said open core, said drive shaft defining a helical recess therearound and receiving said helical flights therein to reduce the exposed cross-sectional height of said flights within said hopper so that said helical flights of said auger lying within said hopper have a unit conveying surface area less than the unit conveying surface area within said distribution means.

3,885,527
HANDLING OF LIVESTOCK

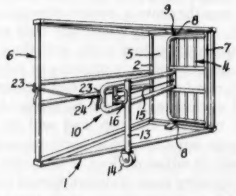
Alan Loader Maffey, Lord Rugby, The Grove Farm, Frankton, nr. Rugby, Warwickshire, England

Filed Nov. 7, 1973, Ser. No. 413,632

Claims priority, application United Kingdom, Nov. 17, 1972, 53263/72; May 7, 1973, 21560/73

Int. Cl. A01k *1/06*

U.S. Cl. 119—98 **11 Claims**



1. An assembly for immobilising an animal and for defining a gap, which may form an exit and/or an entrance to a pen, the assembly comprising, in combination, a frame insertable into said gap, through which the animal may pass, a gate in said frame hinged about a vertical axis and closable partially to close said gap to trap and immobilise an animal moving forwardly through said frame with its head clear of said gap and its shoulders in contact with said gate, operating means for said gate and means for securing said operating means in a position at least partially closing said gate and immobilising the animal with its head clear of said gap and its shoulders in contact with said gate.

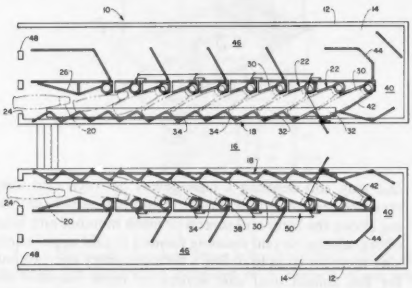
3,885,528
RAPID EXIT MILKING BARN

Ben W. Vandenberg, Artesia, Calif., assignor to August Vandenberg, Artesia and Andrew W. Vandenberg, Bellflower, both of, Calif., part interest to each

Filed Feb. 14, 1974, Ser. No. 442,456

Int. Cl. A01k *1/00*

U.S. Cl. 119—14.03 **1 Claim**



1. In a milking barn for a plurality of cattle, the combination of: an elongated milking structure having primary ingress means and primary egrees means and incorporating a plurality of milking stations; front and rear cattle restraining means at each of said stations; and secondary egress means located between the extremities of said primary egress means and constituted by a plurality of movable gate portions in said front restraining means to permit said cattle to debouch directly into said primary egress means intermediate its extremities, said gate portions being provided at alternate ones of said milking stations to permit said cattle to debouch in pairs from said alternate stations; and common actuating means secured to said gates to permit said gate portions to be simultaneously actuated to prevent or permit egress from said milking stations.

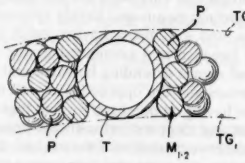
3,885,529
HEAT EXCHANGER STRUCTURE FOR A COMPACT BOILER AND THE LIKE

Peter N. Renzi, Basking Ridge, N.J., assignor to American Standard, Inc., New York, N.Y.

Continuation of Ser. No. 16,202, March 20, 1970, abandoned. This application Dec. 8, 1971, Ser. No. 208,038

Int. Cl. F22b *37/10*

U.S. Cl. 122—367 PF **23 Claims**



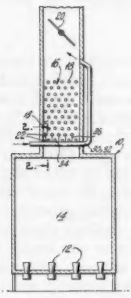
1. A boiler comprising a conduit network through which a first fluid is transmitted, a matrix of discrete conductive bodies which contact each other, said matrix being randomly dispersed between adjacent conduits forming said conduit network and contacting only part of the outer adjacent surfaces of said conduits forming said network, the bodies of said matrix providing tortuous light-transparent spacial paths

therebetween through which a second fluid may pass, said matrix in the direction of flow of said second fluid having plural layers of said conductive bodies, said second fluid being applied directly against the outer wall of said conduit network and being indirectly applied against said outer wall through the spacial paths between the bodies of said matrix, and a burner which discharges the second fluid at an elevated temperature to transfer heat to the first fluid, whereby the second fluid will be applied substantially at the elevated temperature directly, and indirectly through the spacial paths of the matrix, against the outer wall of said conduit network.

3,885,530
SHIELD TUBE SUPPORTS

John A. Kivlen, Denville, N.J.; James E. Massey, Jr., Baton Rouge, and James H. Martin, Jr., Zachary, both of La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 3, 1974, Ser. No. 485,523
Int. Cl. F22b *37/24*
U.S. Cl. 122—510 **10 Claims**



1. A method of supporting furnace tubes exposed to high temperatures at which metal support beams for said tubes are subject to creep failure comprising:

a. providing an air passageway through each of said support beams;

b. admitting cool ambient air to one end of said passageways of (a) and flowing said air therethrough thereby increasing its temperature;

c. removing said heated air of (b) from the passageway of (a) and discharging it into the furnace at a location having negative pressure relative to the pressure of said ambient air;

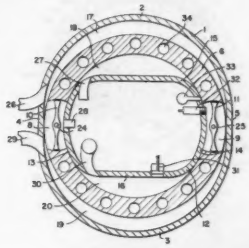
d. insulating each of said tube support beams to limit heat input to said supports sufficient to allow the operating temperature of said support beams to be reduced by air passing through said passageways of (a) to below the temperature at which creep failure occurs,

e. supporting said furnace tubes on pairs of metal supports welded to said beams, one of said supports being within said insulation of (d) and supporting a tube immediately adjacent said insulation and the second of said supports supporting a second tube disposed further away from said passageway and being welded to said first support and outside said insulation of (d).

3,885,531
ROTARY INTERNAL COMBUSTION ENGINE

Hans M. Zollenkopf, Niagara Falls, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 29, 1973, Ser. No. 375,125
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.45 **7 Claims**



1. A rotary internal combustion engine, comprising

an outer housing of substantially hollow cylindrical configuration having a cross-section of a pair of spaced diametrically opposite semicircles joined by a pair of spaced substantially parallel diametrically opposite linear parts; a rotor of substantially hollow cylindrical configuration coaxially rotatably mounted in the outer housing;

an inner housing of substantially hollow cylindrical configuration having a cross-section of a pair of spaced diametrically opposite arcs joined by a pair of spaced substantially parallel diametrically opposite linear parts at substantially right angles to the linear parts of the outer housing, the inner housing being coaxially positioned in the rotor thereby forming a combustion chamber between the rotor and one of the semicircles of the outer housing and between the rotor and one of the linear parts of the inner housing and a compression chamber between the rotor and the other of the semicircles of the outer housing and between the rotor and the other of the linear parts of the inner housing;

a pair of elongated windows formed through the rotor in diametrically opposite positions and extending parallel to the axis of the rotor;

a pair of blades rotatably mounted in diametrically opposite parts of the rotor with their axes parallel to the axis of the rotor, each of the blades being mounted in a corresponding one of the windows;

blade rotating means coupled to the blades for rotating both blades 90° relative to the radius of the rotor for each 90° of rotation of the rotor and 180° in relation to its former position, whereby when the blades are positioned between the linear parts of the outer housing and the arcs of the inner housing said blades are substantially perpendicular to radii of the rotor, and when the blades are positioned between the semicircles of the outer housing and the linear parts of the inner housing said blades are substantially radially positioned in the rotor; and intake and exhaust means extending to the inner and outer housings of said engine.

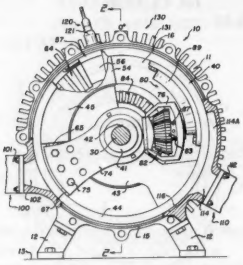
3,885,532
ROTARY ENGINE

Albert Pike, 825 Condor Ave., Victoria, British Columbia, Canada

Filed Nov. 8, 1973, Ser. No. 413,900
Int. Cl. F02b *53/00*
U.S. Cl. 123—43 B **7 Claims**

1. A rotary engine comprising a housing having an annular side wall, a drive shaft journalled in the housing, a rotor non-rotatably mounted on the drive shaft within the housing, said

rotor having a rim adjacent the side wall, a cylinder on the rotor alongside the rim and curved about the axis of rotation of the drive shaft, a piston mounted for reciprocation within the cylinder and having a connecting rod, a rocking beam journalled to rock about the axis of rotation of the drive shaft



and having one end connected to the connecting rod, a pinion rotatably mounted on the opposite end of the rocking beam, a gear carried by the housing in mesh with the pinion, a cam gear rotatable with the pinion, an oscillator gear mounted on the rim in mesh with the cam gear, and said rim having an intake port through which fuel is induced into the cylinder.

3,885,533

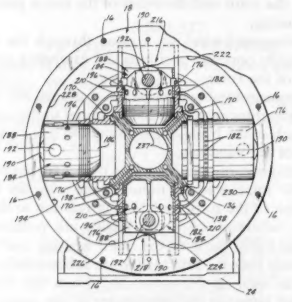
ROTARY INTERNAL COMBUSTION ENGINE AND METHOD OF CONTROLLING THE COMBUSTION THEREOF

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation-in-part of Ser. No. 286,189, Sept. 5, 1972, and Ser. No. 301,096, Oct. 26, 1972. This application Apr. 16, 1973, Ser. No. 351,605

Int. Cl. F02b *57/00*

U.S. Cl. 123—44 E **5 Claims**



1. A rotary internal combustion engine, comprising,

an engine frame means having a rotatable shaft rotatably extending outwardly therefrom,

a rotor means in said frame means mounted on said shaft for rotation therewith,

a plurality of cylinders mounted on said rotor means,

a piston movably mounted in each of said cylinders and being movable between compression and expansion positions with respect thereto; said cylinder having a combustion chamber at one side of said pistons,

a cam plate means on said frame means extending around said rotor means and having a cam surface,

connecting means mounted on each of said pistons and movably engaging said cam surface to cause said piston to be moved in said cylinder as said rotor means is rotated with respect to said cam plate,

said cam surface having at least one lobe provided thereon which extends towards said rotor means, each of said pistons being moved to its maximum compression position as the connecting means thereon engages said lobe, supply means for supplying air and fuel to said cylinders, and means for exhausting the exhaust gases from the engine after the fuel and air mixture has been combusted, said lobe having a cam portion thereon which maintains said piston in a predetermined position to retard the expansion of the volume of said combustion chamber during at least a portion of the period of combustion.

3,885,534

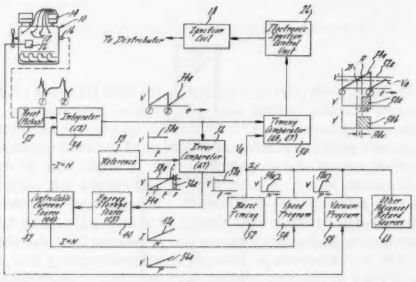
ELECTRONIC ADVANCE AND RETARD CONTROL CIRCUIT

John Lyman Webster, Huntsville, Ala., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 15, 1973, Ser. No. 388,673

Int. Cl. F02p *5/04*

U.S. Cl. 123—117 R **10 Claims**



1. In an internal combustion engine with a closed loop, regulated shaft angle position signal and shaft angular velocity signal generating system, comprising in combination an adjustable current source, integrating means having an input connected to said adjustable current source, reset means responsive to engine rotation periodically resetting said integrating means at regular spaced intervals of engine rotation to produce a sawtooth-shaped signal related to engine shaft angle position in the output of said integrating means, a voltage reference source establishing the regulation level for said sawtooth signal and having a predetermined relationship to the peak amplitude which the sawtooth signal should attain when said integrating means is reset by said reset means, comparator means connected to said reference source and said integrating means to produce an output signal when the amplitude of said sawtooth signal attains said predetermined relationship to the level of said voltage reference source, and means connecting the output of said comparator means to said adjustable current source for adjusting the latter until the output of said integrating means attains said predetermined relationship to the voltage level of said reference source when the integrator means is reset, said integrating means, comparator means and said adjustable current source connected in a closed feedback loop which automatically and continuously regulates the sawtooth-shaped shaft angle position signal in the output of said integrating means and produces the shaft angular velocity signal in the output of the adjustable current source as a result of the regulation of the shaft angle position signal in the output of said integrating means.

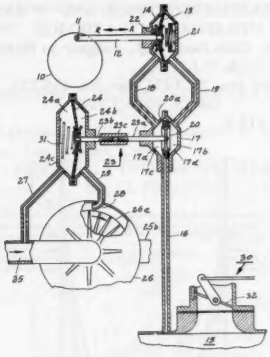
3,885,535
SPARK TIMING CONTROL

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94108

Continuation of Ser. No. 593,363, Nov. 10, 1966, abandoned. This application June 22, 1971, Ser. No. 155,651

Int. Cl. F02p *5/04*

U.S. Cl. 123—117 A **7 Claims**



1. A spark timing control for an internal combustion engine having an intake manifold defining a source of suction comprising a suction operated motor connected to a spark timing mechanism, first conduit means for connecting said motor to the source and to atmosphere for operating the motor to produce an advance of the timing of the spark, second conduit means for connection said motor to the source and to atmosphere for operating the motor to produce a retard of the timing of the spark, and means responsive to a predetermined speed of engine for selectively connecting the source to said first or second conduit means, the motor comprising a movable wall defining an expansible chamber on each side thereof, and said first conduit means is connected to one chamber and the second conduit means is connected to the other chamber, said responsive means including a housing having a pair of bleed openings connected to atmosphere and a valve therein shiftably mounted between a pair of positions and said conduit means comprises a conduit connecting said housing to said source and separate conduits connecting the housing to each of said chambers whereby movement of the valve to one position will connect the source of suction to one of said chambers while closing the source of suction to the other chamber and allow said other chamber to bleed to atmosphere.

3,885,536
RECIRCULATING EXHAUST GAS LOAD INITIATED CONTROL (RELIC)

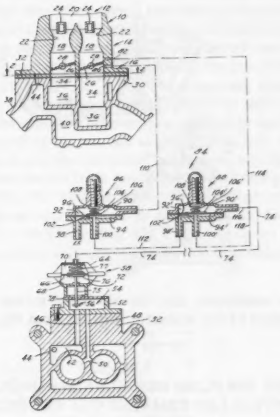
John R. Marshall, Novi, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 23, 1973, Ser. No. 408,953

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A **6 Claims**

1. An exhaust gas recirculating system in an internal combustion engine having intake and exhaust manifolds, a carburetor induction passage, a throttle valve controlling flow through the passage, the system comprising, a duct connecting the exhaust gases to the engine intake manifold, an exhaust gas recirculation (EGR) valve normally closing the duct to prevent recirculation and movable to an open position by a signal vacuum connected thereto, the induction passage containing an exhaust gas recirculating (EGR) port located relative to the throttle valve so as to be traversed by the throttle valve edge during opening throttle valve movements so as to be at essentially atmospheric pressure at closed throttle positions with decreases in pressure level in proportion to the progressive opening of the throttle valve upon exposure of the port to manifold vacuum until EGR port vacuum reaches the level of manifold vacuum, conduit means operatively connecting EGR port signal vacuum to the valve to move the same, a



vacuum regulator in the conduit means for regulating the EGR signal vacuum level including a source of air at ambient or atmospheric pressure connected to the regulator for variably bleeding the EGR signal vacuum to a regulated level, and switch means for shutting off or permitting the flow of air to the regulator to terminate or permit the regulating function of the regulator.

3,885,537
ROAD LOAD MODULATED EXHAUST GAS RECIRCULATION SYSTEM

Roy E. Diehl, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

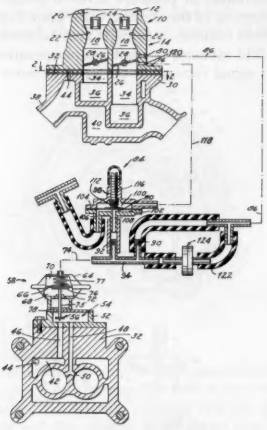
Filed Nov. 5, 1973, Ser. No. 413,159

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A **4 Claims**

1. An exhaust gas recirculating system for an internal combustion engine, having a throttle valve controlling flow through a carburetor induction passage, comprising, a duct connecting the exhaust gases to the engine intake manifold, a spring closed exhaust gas recirculation (EGR) valve normally closing the duct to prevent recirculation and movable to an open position by a signal vacuum connected thereto, the induction passage containing an exhaust gas recirculating (EGR) port located relative to the throttle valve so as to be at essentially atmospheric pressure at closed throttle positions with decreases in pressure level in proportion to the progressive opening of the throttle valve until EGR port vacuum reaches the level of manifold vacuum, conduit means operatively connecting the EGR port signal vacuum to the valve to move the same, and vacuum signal control means in the conduit means for at times reducing the EGR flow by reducing the level of the EGR vacuum signal at the EGR valve to a value below the value at the EGR vacuum port, and below the level necessary to maintain the EGR valve open, the control means including an air bleed means responsive to a predetermined mode of operation of the engine for bleeding air into the conduit means, the conduit means including first and second

flow restrictors in series flow arrangement with each other, the conduit means connection to the EGR valve being between



the flow restrictors, and the air bleed means being located downstream of the restrictor furthest from the EGR port.

3,885,538

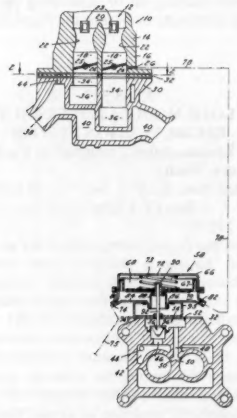
ENGINE AIR PUMP PRESSURE/MANIFOLD VACUUM CONTROLLED EXHAUST GAS RECIRCULATING CONTROL SYSTEM

Mark H. Suter, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1973, Ser. No. 421,382

Int. Cl. F02b *33/00*

U.S. Cl. 123—119 A **5 Claims**



3. An exhaust gas recirculating system, comprising, in combination, an internal combustion engine having an air pump driven by the engine, the air pump producing a supply of air increasing in pressure in proportion to engine speed, the engine having intake and exhaust manifolding and a carburetor with an induction passage connected to the intake manifold and having a manifold vacuum sensing port therein, a duct connecting portions of the intake and exhaust manifolding for recirculating exhaust gases back into the engine, a valve movable between alternate positions to open and close the duct, and a load and speed sensitive servo connected to the valve for moving the same, the servo having a plunger connected to the valve, and differential force means acting on the plunger to open the duct as a function of the differential in pressure between air pump pressure and manifold vacuum conjointly operatively acting on the plunger in one direction opposed by ambient pressure operatively acting on the plunger in the opposite direction.

3,885,539

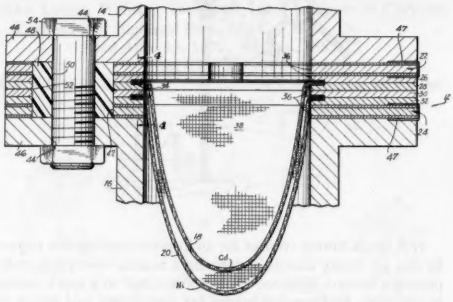
PRECOMBUSTION CATALYST DEVICE FOR USE WITH AN INTERNAL COMBUSTION ENGINE EMPLOYING A VAPORIZABLE LIQUID FUEL AND AN ENGINE UTILIZING SUCH A DEVICE

J. Byron Hicks, Colts Neck, N.J., assignor to Hydro-Catalyst Corp., Colts Neck, N.J.

Filed Jan. 23, 1974, Ser. No. 435,733

Int. Cl. F02b *33/00*

U.S. Cl. 123—119 E **35 Claims**



18. A precombustion catalyst means for interposition between the carubretor and the engine intake of an internal combustion engine employing a vaporizable liquid fuel, said means comprising a pair of spaced foraminous members of dissimilar catalytic metals and a gasket supporting said members spaced from one another and spaced from the carburetor and from the engine intake, said gasket containing an electrolyte in the electrical path between the members and between each member and engine ground

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3,885,540

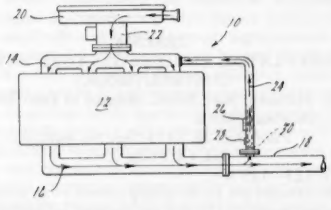
AIR-FUEL RATIO CONTROL SYSTEM FOR A COMBUSTION ENGINE

Henry L. Stadler, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 10, 1974, Ser. No. 478,025

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A **9 Claims**



1. In a system which utilizes a sensor responsive to the partial pressure of oxygen to control the ratio of air to fuel supplied to a combustion engine, said engine having an intake conduit through which air enters the engine, having means for mixing the fuel with the air which enters said engine through said intake conduit and having an exhaust conduit for conducting exhaust gases from said engine, the improvement which comprises:

a third conduit interconnecting said intake conduit and said exhaust conduit, said third conduit permitting a portion of said exhaust gases of said engine to be conducted from said exhaust conduit to said intake conduit, said sensor being located for exposure to the gaseous medium in said third conduit to sense the partial pressure of oxygen in said gaseous medium, and means for modifying the partial pressure of oxygen in said portion of the exhaust gases of said engine to produce a partial pressure of oxygen in said gaseous medium different than the partial pressure of oxygen in said exhaust gases flowing through said exhaust conduit.

3,885,541

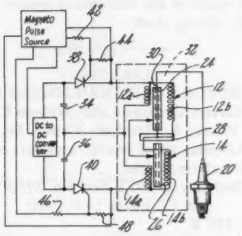
DUAL IGNITION COIL FOR INTERNAL COMBUSTION ENGINE

Arthur G. Hufton, Mobile, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed July 23, 1973, Ser. No. 381,989

Int. Cl. F02p *9/00*

U.S. Cl. 123—148 E **13 Claims**



1. A capacitor discharge ignition system for an internal combustion engine for firing each of the engine spark plugs twice during each combustion interval comprising:

a dual ignition coil apparatus;

means for physically and electrically separating the high voltage winding of each of said coils, one from the other; a single high voltage output lead coupled between said separating means and a terminal of said spark plug;

a pair of electronic switching means operable in timed relationship one to the other to provide ignition impulses to the primaries of said coils at slightly spaced time intervals;

said means for separating the high voltage windings of the coils comprising a carbon material disc, each of said high voltage coils fixed to an opposite surface of the disc at points spaced one from the other, said disc further having connected to its central portion a high voltage output lead.

3,885,542

ENGINE IGNITION SYSTEM ADAPTED TO PREVENT ENGINE ROTATION IN THE WRONG DIRECTION

Georg Haubner, Berg; Walter Hofer, Schwabach, and Peter Schmaldienst, Nurnberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

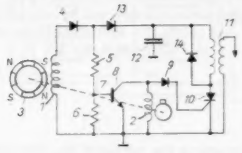
Filed Oct. 1, 1973, Ser. No. 402,625

Claims priority, application Germany, Oct. 2, 1972, 2248293

Int. Cl. F02p *1/17*

U.S. Cl. 123—148 E **6 Claims**

1. In the ignition system of an internal combustion engine having an engine crankshaft, in combination, charging generator means having a mechanical input coupled to the engine crankshaft and having an electrical output winding and operative for generating an AC output voltage; ignition capacitor means; rectifying means connecting said output winding of said charging generator means to said ignition capacitor means and operative for applying across said ignition capacitor means voltage half-cycles of only one predetermined polarity; an ignition transformer having a primary winding and a secondary winding; a fuel igniting unit connected across said secondary winding; circuit means connecting said ignition capacitor means to said primary winding and including an electronic discharge switch having a control input and operative when said discharge switch is conductive for discharging said ignition capacitor means through said electronic discharge switch and through said primary winding of said ignition transformer; triggering signal generating means having a mechanical input coupled to said engine crankshaft and having an electrical output connected to said control input of said electronic discharge switch for controlling the conductivity of the latter and operative for producing triggering signals synchronized with voltage half-cycles produced by said charging generator means; and control means connected to said triggering signal generating means and connected to said charging generator means and operative for preventing said triggering signal generating means from rendering said discharge switch conductive when the voltage half-cycle being generated by said charging generator means is of predetermined first polarity and operative for permitting said triggering signal generating means to render said discharge switch conductive when



the voltage half-cycle being generated by said charging generator means is of opposite second polarity, wherein said triggering signal generating means comprises an electromechanical triggering signal generator having an output winding connected to said control input of said discharging switch and operative for periodically generating triggering signals in synchronism with the generation of voltage half-cycles by said charging generator means, and wherein said control means comprises diverting means connected to said output winding of said charging generator means and connected to said output winding of said triggering signal generator and operative for diverting triggering signals produced by said triggering signal generator away from said control input of said electronic switch when the voltage half-cycle being generated across said output winding of said charging generator means is of said predetermined first polarity, wherein said diverting means comprises a semiconductor switch circuit having an input connected to said output winding of said charging generator means and having an output current path connected across said output winding of said triggering signal generator and operative when the voltage half-cycle being generated across said output winding of said charging generator means is of said predetermined first polarity for substantially short-circuiting said output winding of said triggering signal generator.

3,885,543

ENGINE STARTER CONTROL SYSTEM

Mark Swartz, 134 Babcock St., Brookline, Mass. 02146

Filed Apr. 27, 1973, Ser. No. 354,990

Int. Cl. F02n *11/08*

U.S. Cl. 123—179 B **13 Claims**

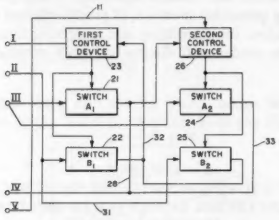
1. In an engine start system for starting an engine and energizing the ignition thereof, said system including a starter motor, a source of electrical energy, an electrically controlled start motor switch, having an electrical input control, said

switch electrically connecting the source to the motor and an ignition switch electrically connecting the source to the starter motor switch input control and to the engine ignition, said ignition switch having OFF, IGNITION and IGNITION-START positions producing in the latter two positions an ignition output signal and an ignition-start output signal, respectively, means for controlling the sequence of energization of the starter motor comprising,

electrical switches A_1, B_1, A_2 and B_2 each having an electrical signal input and output and a control input and each capable of being in a conducting or a non-conducting state between the signal input and output thereof,

first electrically energized control means for switches A_1 and B_1 having an electrical input and having an output and capable of being in one or the other of two electrical states represented by the output thereof,

second electrically energized control means for switches A_2 and B_2 having an electrical input and having an output and capable of being in one or the other of two electrical states represented by the output thereof,



first means coupling the output of the first control means to the control inputs of switches A_1 and B_1

second means coupling the output of the second control means to the control inputs of switches A_2 and B_2,

the said ignition output signal being coupled to the signal inputs of switches B_1 and B_2

the ignition-start output signal being coupled to the signal inputs of switches A_1 and A_2,

means connecting the outputs of switches B_1 and B_2 to the first control means input and

means connecting the outputs of switches A_1 and A_2 to the second control means input and to the starter motor electrical input control,

whereby the starter motor switch cannot be energized to electrically connect the source to the starter motor following switching the ignition switch from the IGNITION-START position to the IGNITION position, except by first switching the ignition switch to the OFF position.

3,885,544

STARTING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Peter W. Pfeiffer, San Marino, Calif., assignor to Colleen B. Hamilton, Arcadia, Calif.

Filed July 5, 1973, Ser. No. 376,671
Int. Cl. F02n *11/14, 11/10*
U.S. Cl. 123—179 SE **7 Claims**

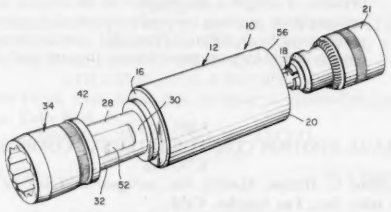
1. A starting device for coupling a rotary starting motor to a starting attachment point of an internal combustion engine, comprising:

an elongated body member having an axial bore at one end and a rotary starting motor driven shaft extending axially from the other end,

an elongated driving shaft having an inner end and an outer end,

overrunning clutch means mounted in said axial bore of said body member and including an outer member affixed to the wall of said axial bore and having an inclined ramp retainer and a plurality of rollers operatively associated with said retainer and said inner end of said driving shaft for connecting said driving shaft to said body member to turn therewith in the same normal rotational direction,

engine starting attachment means for applying starting rotational movement to a starting point of an internal combustion engine, and



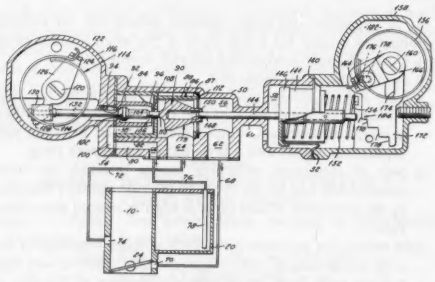
safety connecting means releasably connecting said driving shaft to said attachment means for automatically uncoupling said driving shaft from said attachment means if the rotational speed of the attachment means is greater than that of the driving shaft.

3,885,545

CARBURETOR COLD ENRICHMENT DEVICE

William W. Charron, Orchard Lake; William E. Dickensheets, Southfield; Robert S. Harrison, Grosse Ile, and Alvin P. Nowroski, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed July 2, 1973, Ser. No. 375,973
Int. Cl. F02m *1/06, 1/10*
U.S. Cl. 123—180 R **6 Claims**



1. An air/fuel mixture enrichment device for use with a carburetor having an induction passage open to air essentially at atmospheric pressure at one end and adapted to be connected to an internal combustion engine intake manifold at the opposite end, a throttle valve mounted for a rotative movement across the passage between closed and fully open positions to control flow through the passage, and a fuel reservoir, the device including control means to supply an air/fuel mixture to the carburetor during cold weather engine cranking and running operations that is supplemental to the carburetor normal air/fuel mixture supply, the control means comprising;

first conduit means connecting fuel from the reservoir and air to a port in the induction passage located at a point below the closed position of the throttle valve and subject to engine vacuum,

first temperature responsive valve means variably movable from a first position closing the conduit means when the temperature is at a predetermined level to subsequent positions progressively opening wider the conduit means when the temperature progressively decreases below the predetermined level, and

vacuum servo means responsive to the engine vacuum attaining an engine running level and acting thereon for moving the valve means at times in a closing direction to decrease the supplemental fuel and airflow,

second temperature responsive means operably connected to the servo means for controlling the movement of the servo means as a function of temperature changes,

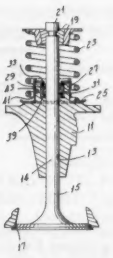
the second temperature responsive means being responsive to ambient temperature changes from a predetermined level.

3,885,546

VALVE STEM SEAL AND LUBRICATOR

Thomas J. Foley, Southfield, and Arthur E. Witzke, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 5, 1973, Ser. No. 413,138
Int. Cl. F01l *3/00*
U.S. Cl. 123—188 P **15 Claims**



1. A combination seal and lubricator means, a fixed member and a cylindrical member reciprocable relative to and protruding from the fixed member,

said seal and lubricator means comprising

an annular member secured to the fixed member and positioned about the cylindrical member, said annular member engaging the circumference of said cylindrical member,

said annular member comprising porous material and elastomeric material, said elastomeric material interposing portions of said porous material, said elastomeric material being under tension when installed about the cylindrical member.

3,885,547

REFUELING AND IGNITION GROUNDING DEVICE FOR SMALL ENGINES EQUIPPED WITH A PROTECTIVE HOOD

Donald G. H. Doepke, Greenfield, and Daniel E. Braun, Brookfield, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

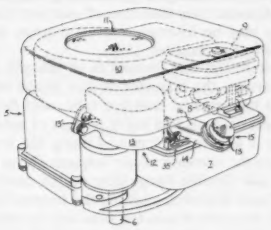
Filed Feb. 15, 1974, Ser. No. 442,871
Int. Cl. F02b *77/00*
U.S. Cl. 123—198 D **9 Claims**

7. In a small engine having a magneto ignition system with a grounding terminal that can be electrically connected to the engine body to prevent the engine from running, and having a fuel tank secured to the engine body at a location alongside the same, and wherein the top portion of the fuel tank is substantially inaccessible, means for facilitating safe refueling, comprising:

A. a substantially S-shaped filler spout having a cylindrical, downwardly opening inner end portion and an upwardly opening outer end portion;

B. cooperating means on the top of the fuel tank and the inner end portion of the filler spout rotatably mounting the filler spout for swinging motion between a normal position in which its outer end portion is substantially inaccessible and a refueling position in which said outer end portion is readily accessible;

C. switch means on the top of the fuel tank connected with said grounding terminal to ground the same when the switch means is closed; and



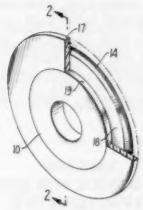
D. switch actuating means on said filler spout operable to effect closure of said switch means as the filler spout is swung to its refueling position.

3,885,548

CUTTING WHEEL ASSEMBLY

Barrie F. Regan, 1760 Manor Dr., Hillsborough, Calif. 94010

Continuation-in-part of Ser. No. 376,536, July 5, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,594
Int. Cl. B28d *1/04*
U.S. Cl. 125—15 **2 Claims**



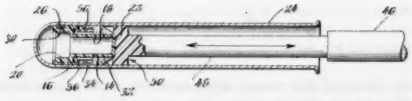
1. A cutting wheel assembly comprising a wheel body having a circular hub with an integral peripheral flange, the hub having a shoulder extending axially from said flange, a thin cutting disc formed of abrasive particles embedded in a metal matrix firmly bonded to said flange on the same side thereof as said shoulder and projecting radially from said flange and a protective readily removable flexible washer having a diameter slightly greater than that of the cutting disc fitted on said hub shoulder and in close contact with the cutting disc.

3,885,549

APPARATUS FOR PRODUCING A VACUUM IN A TEST TUBE

David Thomas Green, Wolfpit Ave., Norwalk, Conn. 06851

Continuation of Ser. No. 266,396, June 26, 1972, abandoned. This application May 29, 1974, Ser. No. 474,236
Int. Cl. A61b *5/14*; **A61m** *1/00*
U.S. Cl. 128—2 F **7 Claims**



1. A device for forming a vacuum in a test tube when inserted, moved along the length therein and then partially

withdrawn therefrom, the partial withdrawal sealing the test tube to maintain the vacuum produced therein, comprising

a. a test tube which is desired to be evacuated having walls therein,

b. a cap on said test tube having an integral body formed of a cylindrically shaped upper portion sealed on one end thereof, and an enlarged cylindrically shaped lower portion of diameter less than that of said test tube, whereby said cap may be inserted, moved therein, and partially withdrawn from said test tube,

c. a flexible flange ring formed as an integral part of said lower portion, the diameter of said flange being greater than the diameter of said test tube, said flexible flange being bent back on said lower portion of said body when said cap is inserted and moved along the length of said test tube, the pressure of air trapped ahead of said cap forcing said flexible flange ring out of contact with the walls of said test tube, allowing the trapped air to escape between the walls of said test tube and the smaller diameter of said integral body, said flexible flange contacting the walls of said test tube as said cap is partially withdrawn thereform to maintain the vacuum in said test tube below said cap,

d. an insertion tool having detachable mounting means positioned on one end thereof engaging said cap and moving said cap in said test tube, and

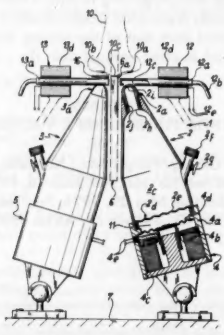
e. flexible detent means mounted on said upper portion of said body engaging said detachable mounting means of said insertion tool, said detent means and said detachable mounting means defining means whereby said insertion tool remains mounted on said cap so long as the walls of said test tube are in contact with said flexible detent means, said flexible detent means releases said insertion tool from said cap when said upper portion of said cap is removed from said test tube, said flexible detent means being deflected by said detachable mounting means on removal from said test tube, thereby gripping the top of said test tube by said cap to prevent said cap from moving back into said test tube which has been evacuated thereby.

3,885,550

METHOD AND DEVICE FOR DIFFERENTIAL OLFACTOMETRY

Patrick MacLeod, Chatenay Malabry, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 30, 1973, Ser. No. 420,613
Claims priority, application France, Dec. 8, 1972, 72.43805
Int. Cl. A61b *5/00*
U.S. Cl. 128—2 R **14 Claims**



1. Method for measuring respective odor intensities of olfactory stimuli, comprising the steps of:

a. presenting two olfactory stimuli simultaneously to the nose, one to each nostril, one of the stimuli comprising a standard stimulus and the other of the stimuli comprising a stimulus to be measured,

b. comparing the respective intensities of the stimuli by determining which of the stimuli is the stronger as perceived within one of the nostrils,

c. adjusting the amplitude of the stimulus to be measured relative to the amplitude of the standard stimulus until the intensities perceived in both nostrils are about equal, and

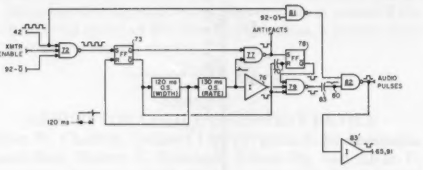
d. determining the difference in amplitude between the standard stimulus and the stimulus to be measured when the intensities perceived in both nostrils are about equal.

3,885,551

ARTIFACT REJECTION FOR BLOOD PRESSURE MONITORING

Harold Lee Massie, Hightstown, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 130,422, May 1, 1971, abandoned.
This application July 19, 1973, Ser. No. 380,805
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 A **8 Claims**



5. In electronic apparatus, such as indirect blood pressure measuring apparatus having means for analyzing patient derived electrical signals which include tone bursts containing a plurality of pulses indicative of certain physiologic activity, in which only signals determined as non-artifact are passed and those signals determined to be artifact are selectively rejected and inhibited from passing based upon a predetermined pulse width or rate, the combination comprising:

means for delaying said signals for a first period, the first period defining a desired maximum pulse width and a second period, the first period and second period together defining a desired maximum rate, said delaying means including first means receiving said signals for providing said first period and second means directly coupled to said first means for providing said second period, said second period being caused to commence upon the termination of said first period;

first gate means connected from said delay means; and

detector means for comparing non-delayed derived signals with said delayed signals during said second period and controlling said first gate means to pass the delayed signals upon the absence of non-delayed signals and to inhibit the passage of the delayed signals upon the presence of non-delayed signals.

3,885,552

CARDIAC FUNCTION MONITORING SYSTEM AND METHOD FOR USE IN ASSOCIATION WITH CARDIAC PACER APPARATUS

James R. Kennedy, Gainesville, Fla., assignor to Pacemaker Diagnostic Clinic of American, Inc., Gainesville, Fla.

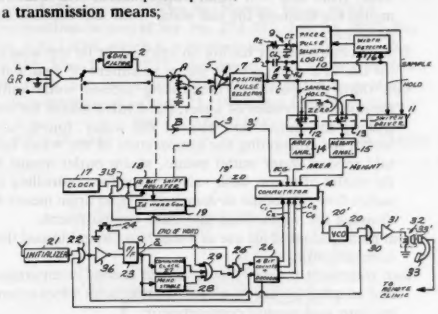
Filed Nov. 16, 1972, Ser. No. 307,182
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.05 R **28 Claims**

1. A system for providing transtelephonic information for a plurality of patients remotely located from a central data processing clinic, the information to be transmitted being related to coronary functions and including artificial cardiac pacer pulse information, comprising:

means responsive to cardiac pacer pulses including bandwidth compression means for producing outputs repre-

sentative of selected characteristics of said cardiac pacer pulses, said outputs having a bandwidth substantially less than the cardiac pacer pulses;

a transmission means;



control means for sequentially producing gating signals for sequentially gating each of said respective outputs to said transmission means,

said transmission means responsive to said outputs for producing output audio signals indicative respectively of each of said outputs.

3,885,553

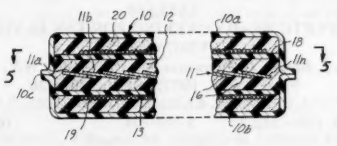
FLEXIBLE THERAPEUTIC PAD AND VIBRATORY ARMATURE THEREFOR

Luigi Vecchio, 2040 E. Amado, Palm Springs, Calif. 92262

Filed Oct. 29, 1973, Ser. No. 410,452

Int. Cl. A61h *29/00*

U.S. Cl. 128—24.1 **18 Claims**



1. A pad comprising:

an electrically conductive coil for conducting alternating electrical current;

an armature lying generally in a plane within said coil,

said armature comprising a plurality of strips of magnetic material, each of which overlaps the next and generally lies in a plane oblique to the plane of the armature;

and

a body of compliant material covering and in contact with each side of said armature between the coil and the armature, the compliant material being adherent to the sides of the armature,

whereby flow of alternating electrical current through the coil creates an alternating magnetic field surrounding said pad.

3,885,554

APPARATUS FOR GENERATING PULSES OF FLUID PRESSURE

Adelbert W. Rockwell, Jr., Gloucester, Mass., assignor to USM Corporation, Boston, Mass.

Filed Dec. 8, 1972, Ser. No. 313,583

Int. Cl. A61h *1/00*

U.S. Cl. 128—24 R **1 Claim**

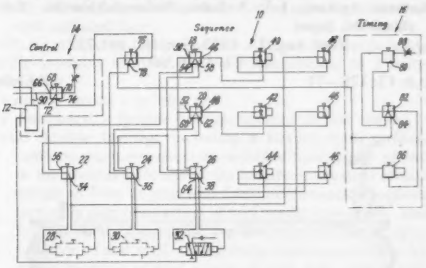
1. Apparatus for sequentially supplying fluid pressure to a system of more than two bladders according to a predetermined sequence, said bladders being adapted to apply external pressure to portions of the human body comprising:

A. A source of pressurized fluid connected to each bladder;

B. A valve connected to each bladder for controlling the flow of pressurized fluid thereto;

C. Means in each bladder for sensing the pressure therein;

D. A selector for generating fluid pressure signals for actuating the pressure control valves of the bladders according to the predetermined sequence;



E. Means to receive the pressure from the pressure sensors, compare said pressure with a predetermined value, and generate a fluid pressure signal when a predetermined relation between said pressures exists;

F. Means responsive to the fluid pressure signals from the selector and the pressure comparator to sequentially actuate the valves to inflate and deflate the bladders; and

G. Timing means associated with the pressure comparator to control the overall cycling time of each bladder.

3,885,555

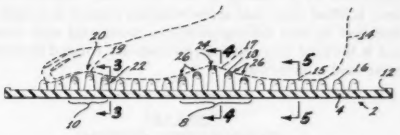
FOOT MASSAGE PAD

Mulford J. Nobbs, Hacienda Heights, Calif., assignor to Con-Stan Industries, Inc., City of Industry, Calif.

Filed Jan. 28, 1974, Ser. No. 437,010

Int. Cl. A61h *1/02*

U.S. Cl. 128—25 B **12 Claims**



1. A foot exercising and massaging pad comprising:

a base member;

a plurality of upstanding resilient protuberances formed on a surface of said base member;

an arch region and a toe joint region defined by protuberances of greater height;

said arch region and toe joint region being spaced apart by a distance which approximates the distance between the arch and toe joint of a human foot;

the protuberances in the arch region and in the toe joint region being varied in height in a direction transverse to said arch region and toe joint region with the variation in the height of the protuberances in said transverse direction approximating the curvature of the arch and toe joint of the human foot, and

the protuberances in said arch region varying in height in a generally uniform manner in a direction along the axis of the arch region with the protuberances increasing gradually in height in proceeding from either end of the arch region along the axis of the arch region toward the center of the arch region,

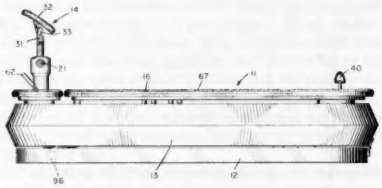
whereby the user of the exercising and massaging pad can increase the stimulation of the arch of the foot by moving the foot from the ends of the arch region toward the center of the arch region to bring protuberances of

greater height in said arch region into contact with the arch of the foot.

3,885,556
INCLINABLE BED ADAPTED FOR USE TO MEDICAL CARE

Katsuzo Agatani, 1-3, 3-chome, Naka-yoshino-cho, Tokushima-shi, Japan

Filed Aug. 27, 1973, Ser. No. 391,757
Int. Cl. A61f *5/00*
U.S. Cl. 128—71 **8 Claims**

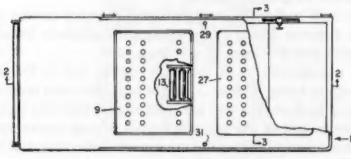


1. An inclinable bed adapted for use to medical care, comprising: a base; a bed body laid over said base, the rear end thereof being pivotally connected thereto and having a hanging means; a foot-moving means and a transversely moving plate on the upper surface of said bed body; a lifting mechanism having screw rods supported by bearings fixed to said base in the longitudinal direction thereto; a motor mounted on said base to rotate said screw rods through a power transmitting device; nuts engaged to said screw rods and divided respectively into a replaceable nut body and a nut holding means so that said nut body can be removably secured in the inside of said nut holding means; and a plurality of connecting rods, one end of each of which is connected through a bearing to said nuts so that said connecting rods can rotate in a plane vertical to said nuts and the other end of each of which is connected by a bearing to said bed body, wherein the bed body is lifted when said screw rods are rotated in a right hand direction by said driving motor to move said nuts rearward and is lowered when said screw rods are rotated reversely to move said nuts forward.

3,885,557
HYDROPATHIC SYSTEM

Pedro A. Varea, 116 38th St., Union City, N.J. 07087

Filed Nov. 15, 1973, Ser. No. 415,954
Int. Cl. A61h *9/00*
U.S. Cl. 128—65 **10 Claims**



1. A hydropathic system for hot and cold water, salt water, and steam treatments for patients, said system comprising, in combination:

a first compartment adapted to house equipment for use in a hydropathic treatment;

a second compartment having an opening at its top adapted for use in a salt water treatment of patient;

said second compartment comprising first water outlet means for the outlet of salt water, first valve means for controlling the outlet flow rate of the salt water, second valve means for controlling the temperature of the salt water from said first water outlet means, and first drain means for draining the salt water from said second compartment;

a third compartment having an opening at its top adapted for use in a water and/or steam treatment of a patient;

said third compartment comprising second water outlet means for the outlet of water, third valve means for controlling the outlet flow rate of the water, fourth valve means for controlling the temperature of the water from said second water outlet means, steam outlet means for the outlet of steam, fifth valve means for controlling the outlet flow rate of the stream, and second drain means for draining the water from said third compartment;

seat means adapted for use as a seat by a patient in said third compartment;

foot treatment means located in said second compartment and adapted for use by a patient sitting with a foot extending into said second compartment;

said foot treatment means comprising a plurality of rotatable cylinders arranged parallel and defining a common plane;

first water supply means for supplying salt water to said first water outlet means;

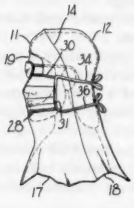
second water supply means for supplying water to said second water outlet means;

steam supply means for supplying steam to said steam outlet means; cover means to cover said second and said third compartments top openings whereby a continuous top surface is defined for said first, second, and third compartments for use by a patient on which to lie for a treatment; and main valve means for controlling the supply and temperature of the salt water, water, and steam of said supply means.

3,885,558
COMPLETE HEAD COVERING FOR USE IN STERILE ENVIRONMENTS

Nathan L. Belkin, 16 Panorama Dr., Huntington, N.Y. 11743

Filed Nov. 8, 1972, Ser. No. 304,620
Int. Cl. A61b *19/00*
U.S. Cl. 128—142.7 **16 Claims**



1. An inexpensive, disposable head covering for sterile environments, said head covering comprising:

A. first and second sheets of material joined together along their peripheries, except along a bottom edge, to form an enclosure large enough to be placed over a wearer's head with said bottom edge reaching wearer's shoulders;

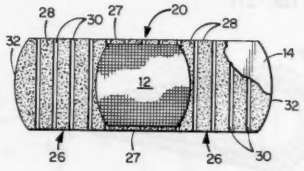
B. an opening in said material; and

C. a face mask of filter material having an upper edge spaced from the upper edge of said opening defining the boundaries of an eye slot, and having a lower edge secured to the lower edge of said opening, and closure means attached to the respective side edges of said mask adapted to be looped behind said head covering to hold the mask securely over the wearer's nose and mouth and to hold the head cover in place on the wearer.

3,885,559
PROCESS FOR THE REDUCTION OF PAIN IN THE REMOVAL OF ADHESIVE TAPES AND BANDAGES

George J. Economou, 8 Elm St., Norton, Mass. 02110

Continuation-in-part of Ser. No. 274,449, July 24, 1972, Pat. No. 3,811,438, which is a continuation-in-part of Ser. No. 239,688, March 30, 1972, abandoned. This application Mar. 29, 1974, Ser. No. 456,435The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.
Int. Cl. A61l *15/00*
U.S. Cl. 128—156 24 Claims

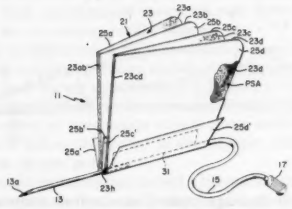


1. A process for the reduction of pain or discomfort in the removal of a tape from a receptor region comprising receptor cells, which process comprises removing an adhesive tape from a receptor region of receptor cells subject to excitation by stimuli, which tape comprises a backing and an adhesive portion comprising a plurality of adhesive layers and a plurality of regions of lesser adhesiveness, the layers adhered with the regions of lesser adhesiveness between such layers, the regions and layers being straight and successively alternating along the longitudinal length of said backing, each layer and each region characterized generally by a uniform width and having a minimum width of about 0.02 inches, the number of said layers or regions per linear inch of tape being from 4 to about 25, the removal being generally perpendicular to the longitudinal edges of the tape, thereby reducing frequency-dependent responsiveness of the receptor cells upon removal of the contacted tape.

3,885,560
NEEDLE ASSEMBLY HAVING A FOLDED BANDAGE HANDLE

Brian E. Baldwin, Wilmette, Ill., assignor to Affiliated Hospital Products, Inc., St. Louis, Mo.

Continuation of Ser. No. 42,713, June 2, 1970, abandoned. This application Oct. 17, 1972, Ser. No. 298,282
Int. Cl. A61m *5/00*, *25/02*
U.S. Cl. 128—214 R 35 Claims



23. A portable and manually manipulable needle and bandage assembly unit for insertion in and adhering connection to a body member as a unit, comprising

a folded flexible securing sheet forming a manually graspable handle in its folded form and having intersecting cross-fold lines formed by a first fold along one line and a second fold along a line transverse to and intersecting said first fold forming at least four fold-interconnected sections,

a pointed needle secured to said sheet and extending through an opening formed in a central zone of said sheet at the intersection of said fold lines and beyond its folded periphery,

said securing sheet having an adhesive surface on one face thereof and a removable protective backing thereon,

said needle being removably secured to said foldable flexible securing sheet on the face thereof opposite said adhesive surfaced face.

27. An attachable freely manually manipulable and portable needle assembly unit for removable attachment to a body, comprising

a needle having a pointed end,

a multifunction flexible bandage secured to said needle,

said flexible bandage including a flexible body-surface-conformable cover sheet cross-folded transversely of and in the general direction of the longitudinal extent of said needle to form at least four fold-interconnected sections to enable ease of insertion of said needle into a body, and for unfolded covering of a puncture site formed upon insertion of said needle into a body member, as well as for aid in securing of said needle to said body said needle extending beyond said cross-folded sheet.

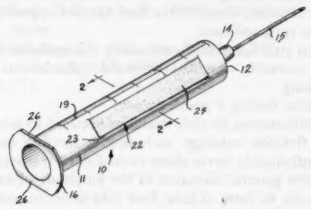
3,885,561
CATHETER

Charles N. Mazal Cami, Roma No. 19, Mexico 6, D.F., Mexico

Continuation-in-part of Ser. No. 312,236, Dec. 4, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,690
Int. Cl. A61m *5/00*; A61b *25/00*, *27/00*
U.S. Cl. 128—214 3 Claims

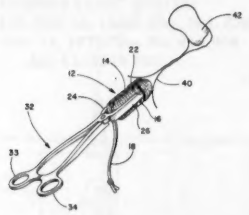
1. A catheter for epidural anesthesia composed of a plastic material having its near end open and adapted for connection to a syringe and having its distal end closed and rounded and having embedded in its internal portion a metallic piece which is opaque to X-rays, said catheter having near its distal end a plurality of longitudinal slits for delivering anesthetic, each of said slits being both longitudinally and circunferentially offset from the nearest slit so that each slit be placed in a different diametral plane, and being so spaced from the adjacent slit that the diametral planes on which they are located form an angle of at least 45°, thus giving the catheter substantially equal rigidity to that of a catheter having no slit whatever.

3,885,562
SYRINGE WITH WRITING SURFACE
John C. Lampkin, Box 3501, Tallahassee, Fla. 32303
Filed Nov. 16, 1973, Ser. No. 416,536
Int. Cl. A61m *5/18*; G09f *3/00*
U.S. Cl. 128—218 R 2 Claims



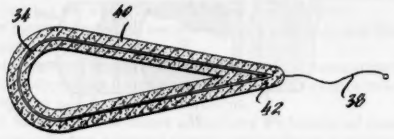
1. A hypodermic syringe comprising an elongated substantially non-flexible barrel having wall structure defining a bore adapted to receive a plunger, said barrel being substantially closed at one end and open at the other end, means on said substantially closed end for mounting a hollow needle, an enlarged flange integrally formed on said barrel adjacent the open end, said flange having at least one substantially flat portion located adjacent to said barrel and extending laterally thereof for engaging a substantially level surface, indicia fixed on said barrel and extending longitudinally thereof for indicating the volume of the contents within the same, a roughened writing surface integrally formed on the exterior of said barrel generally opposite the flat portion of said flange, said writing surface extending substantially axially of said barrel adjacent to said indicia, whereby when the flat portion of said flange is placed in engagement with a supporting surface, said barrel is stabilized so that indicia identifying the contents can be written on said writing surface and can be observed without handling the syringe.

3,885,563
SPREADABLE TAMPON AND INSERTER COMBINATION
Russell L. Johnson, Weyauwega; Leonard M. Kaczmarzyk, Menasha, and Robert F. Skora, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed June 10, 1974, Ser. No. 477,630
Int. Cl. A61f *13/20*
U.S. Cl. 128—263 10 Claims



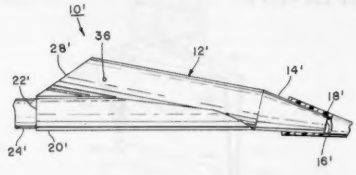
1. The combination of a tampon particularly adapted to be transversely spread within the vagina at the time of insertion and an inserter device adapted for inserting and spreading said tampon; said tampon comprising an elongate absorbent member folded on itself to form a pair of adjoining, upwardly extending legs and having a withdrawal string attached near the base of said legs; the upper end portion of each of said legs being provided with an open pocket disposed on the exterior side thereof with the open end of each of said pockets facing downwardly; said inserter comprising an elongate device provided with a grip portion at one end and a tampon delivery portion at the other end; the tampon delivery portion comprising a pair of generally parallel extensions adapted for movement away from each other by manual operation of said grip portion; the extensions of said tampon delivery portion being disposed in the pockets of said tampon whereby manipulation of said grip portion will spread apart the legs of said tampon.

3,885,564
VAGINAL MEDICATOR
Harvey H. Groves, 6 Cherry Ln., Westport, Conn. 06880
Division of Ser. No. 274,263, July 24, 1972, Pat. No. 3,815,600. This application May 6, 1974, Ser. No. 467,071
Int. Cl. A61m *31/00*
U.S. Cl. 128—271 16 Claims



1. A vaginal medicator comprising:
A. an elongated body-undissolvable stem means extending along substantially the entire length of the vaginal canal to the region of the cervix, the stem means including a loop having a curved portion at the inner end thereof adapted to be positioned behind and to at least partially surround the cervix, said curved portion serving to hold and position the vaginal medicator within the vaginal canal;
B. body-dissolvable medication carried by said stem means for slowly dissolving in the vaginal canal to supply medication thereto; and
C. pullout means connected to the body-undissolvable portion of the vaginal medicator and extending out from the vaginal canal when the medicator is in place therein for providing easy removal of the medicator.

3,885,565
SUCTION DRAINAGE CONTROL CONNECTOR
Fred E. Satchell, Chesterfield, Mo., assignor to Sherwood Medical Industries, Inc., St. Louis, Mo.
Filed Nov. 7, 1973, Ser. No. 413,716
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 5 Claims



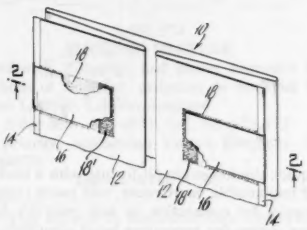
1. A suction drainage control connector, comprising an elongate hollow body having an outlet passage terminating in an outlet port adapted to communicate with a source of suction, an inlet passagge in fluid communication with said outlet passage and having an inlet port adapted to receive a suction catheter, and a suction control passage in fluid communication with said inlet and outlet passages and terminating in a control port adapted to be occluded by the user to regulate the suction applied to said catheter, said control passage extends angularly relative to said inlet passage, and said body having a relief port extending through the side wall of said control passage to the atmosphere between said control port and said outlet port for providing a continuous flow of air in said con-

trol passage toward said outlet passage from the atmosphere when said control port is occluded, and wherein the cross-sectional area of said control port is substantially greater than the cross-sectional area of said relief port.

3,885,566
DISPOSABLE DIAPER WITH INTEGRAL ABHESIVE REINFORCING AREAS

Ezekiel J. Jacob, 25 Monroe Pl., Brooklyn, N.Y. 11201

Filed Apr. 17, 1973, Ser. No. 353,306
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **2 Claims**

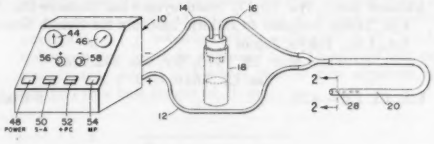


1. In a tape-fastenable disposable diaper comprising a facing sheet of water permeable material, a backing sheet of water-impermeable material, a filling therebetween of absorbent fibrous cellulose material, a pair of pressure-sensitive adhesive tape fastening strips, the improvement which comprises the addition of water-sensitive abhesive areas on the facing sheet underlying the tape strips, terminal sections of said tape strips resting releasably upon said abhesive areas.

3,885,567
GASTROINTESTINAL ASPIRATOR PUMP

John R. Ross, 370 Clyde St., Brookline, Mass. 02167

Filed Feb. 20, 1973, Ser. No. 333,871
Int. Cl. A61m *1/00*
U.S. Cl. 128—278 **4 Claims**



1. An aspirator-pump and tube combination for evacuating liquid from an intestinal cavity wherein debris or tissue can block the evacuating means comprising:

a. air pump means with connections to supply both positive and negative pressure (relative to atmospheric) air;

b. a multi-lumen tube adapted to be inserted into said cavity having a positive air pressure lumen connected to the positive air connection of said pump and a negative pressure lumen connected to the negative pressure connection of said pump;

c. means including valves and a timer for supplying positive pressure air from said pump to said positive air pressure lumen for a measured period of time;

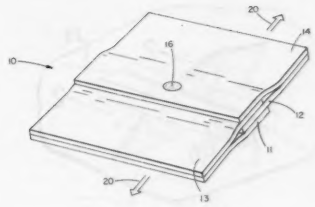
d. means for withdrawing liquids from said cavity comprising walls forming a negative pressure opening in said negative pressure lumen communicating with said cavity, and

e. means for moving debris or tissue away from said negative pressure opening comprising walls in said positive air pressure lumen forming a positive air pressure opening, and additional walls supporting said positive air pressure opening in position to project air against said debris or tissue blocking the negative pressure opening during said period.

3,885,568
EXPANDABLE ARTICLE

Charles H. Schaar, 1300 Country Clud Rd., Lake Zurich, Ill. 60047

Division of Ser. No. 128,267, March 26, 1971, Pat. No. 3,816,227, which is a continuation-in-part of Ser. No. 41,377, May 28, 1970, abandoned. This application July 12, 1973, Ser. No. 378,405
Int. Cl. A61f *13/16*
U.S. Cl. 128—287 **12 Claims**

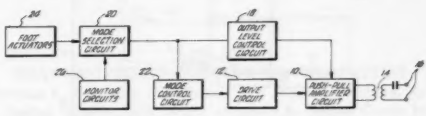


1. A disposable diaper having an expandable fluid impervious back sheet and an expandable, fluid pervious cover sheet enclosing a bulkable product comprising bendable sheet material superposed together in flat planar relation and presenting more layers of said sheet material in a central region of said product than in other regions thereof, means retaining portions of said layers in said central region in said superposed planar relation and remaining portions of said sheet material being movable independently of each other in a predetermined direction into irregularly bent non-planar layers patulously bulking said product and retaining said product in bulked configuration, at least some of said layers being formed of an absorbent sheet material.

3,885,569
ELECTROSURGICAL UNIT

Donald W. Judson, Simi Valley, Calif., assignor to The Birtcher Corporation, Los Angeles, Calif.

Filed Nov. 21, 1972, Ser. No. 308,488
Int. Cl. A61n *3/02*
U.S. Cl. 128—303.14 **26 Claims**



1. An electrosurgical unit for generating electrical signals to be applied to the body of a patient by an electrosurgical electrode for producing surgical cutting and coagulation as selected, said electrosurgical unit comprising:

a pair of output terminals adapted to be coupled to the electrosurgical electrode;

first means for providing a continuous alternating current cutting signal having a selected freuency that produces surgical cutting when applied to the body of a patient;

second means for cyclically disabling said first means to provide a coagulating signal that is a succession of bursts of said alternating current signal, said coagulating signal providing coagulation when applied to the body of a patient;

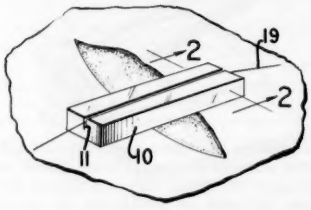
third means for altering the disabling cycle of said second means to extend the length of time said first means operates and to provide a blended signal that alternately produces cutting and coagulation when applied to the body of a patient; and

output means for applying the blended signal to the output terminals.

3,885,570
WOUND SPLINTS

Harry H. Leveen, 800 Polly Pl., Brooklyn, N.Y. 11209

Continuation-in-part of Ser. No. 158,687, July 1, 1971, Pat. No. 3,789,851, which is a continuation-in-part of Ser. No. 813,478, April 4, 1969, abandoned. This application Dec. 17, 1973, Ser. No. 425,536
Int. Cl. A61b 17/04
U.S. Cl. 128—335 6 Claims

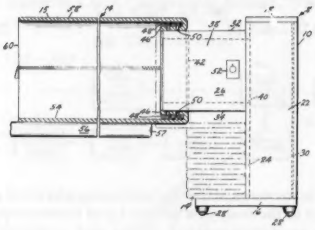


1. A wound splint in the form of a semi-rigid flat resilient bar of pliable elastomeric plastic material, means defining a suture receiving groove extending lengthwise of said bar, said means including sides of said groove gradually converged downwardly from the surface of said bar, said sides being displaceable, whereby a suture placed in said groove displaces said sides frictionally to engage said sides.

3,885,571
PERSONAL COOLING DEVICE

Charlotte Cramer Sachs, 1200 Fifth Ave., New York, N.Y. 10029

Filed Oct. 19, 1973, Ser. No. 407,933
Int. Cl. A61f 7/00
U.S. Cl. 128—400 1 Claim

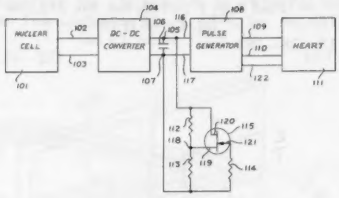


1. A personal cooling device for use by a sleeping user comprising: a generally vertically oriented cabinet having an entrance opening and an exit opening, absorptive type electrically powered cooling means disposed within said cabinet communicating with said entrance and exit openings, a flexible horizontally disposed elongated conduit means of a size and configuration adapted to surround a user, and be supported upon a bed, said conduit having a first distal opening disposed in the area of the head of a user, and a second proximal opening communicating with said outlet opening, and thermostatic means disposed in the area of said outlet opening controlling the operation of said absorptive cooling means; whereby during use, said cooling means provides solely by convection a continuous current of cooling air to said proximal opening of said conduit means which flows past said thermostatic means and exits through said distal opening.

3,885,572
QUICK DISCHARGE CIRCUIT FOR PACER NUCLEAR POWER SUPPLY

Chieh Yang Chen, Billerica, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 30, 1973, Ser. No. 420,411
Int. Cl. A61n 1/36
U.S. Cl. 128—419 P 7 Claims

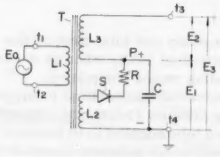


7. A quick discharge circuit for use with a nuclear battery powered implantable heart pacer, said pacer comprising terminal means for connection to said patient's heart, pulse generating means for generating heart stimulating pulses on said terminal means, voltage source means for providing a first voltage level, means for converting said first voltage level to a second voltage level, means utilizing said second voltage level for energizing said pulse generating means, said energizing means including capacitor means, means for charging said capacitor means to said second voltage level, circuit means for providing a third voltage level below the lower of said first and said second levels, and wherein said quick discharge circuit comprises means for rapidly discharging said capacitor means to below said third voltage level when said converting means malfunctions.

3,885,573
THERAPEUTICAL APPARATUS APPLYING SUPERPOSED OUTPUT OF DC AND AC VOLTAGES

Akikuni Hara, No. 50-17, Motoyoyogi-cho, Shibuya-ku, Tokyo, Japan, assignor to Hakuju Institute for Health Science Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1973, Ser. No. 342,938
Int. Cl. A61n 1/36
U.S. Cl. 128—420 5 Claims



1. A therapeutic treatment apparatus utilizing superimposed DC and AC voltages, said apparatus comprising: therapeutic voltage generating means for generating an output comprising superimposed DC and AC voltages, means for producing a therapeutic electric field including first and second parallel opposed electrodes, and means for connecting the output of said therapeutic voltage generating means to said electrodes, said therapeutic voltage generating means including transformer means comprising a primary winding adapted to be connected to an AC power source, and first and second secondary windings, one of said secondary windings forming an AC generating circuit, a rectifier means, means for connecting said rectifier means to the other of said secondary windings so as to form a DC generating circuit, and means for connecting said DC generating circuit to said AC generating

circuit in a mutually superimposed relationship to therapeutic voltage terminals so that an output comprising superimposed DC and AC voltages is presented at said terminals, said therapeutic voltage terminals being connected respectively to said opposed electrodes of said therapeutic electric field producing means and one of said electrodes being adapted to be connected to the subject for therapeutic treatment, the AC voltage presented at said terminals being a low AC voltage as compared to the AC voltage used in conventional therapeutic treatment apparatus.

3,885,574

SMOKING MIXTURE

James Borthwick, Glasgow, and James Forrester Morman, Troon, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 18, 1971, Ser. No. 125,872

Claims priority, application United Kingdom, Mar. 23, 1970, 13860/70

Int. Cl. A24b *15/00*

U.S. Cl. 131—2 **9 Claims**

1. A smoking mixture in fabricated form comprising
   a. as smoke-producing fuel, a particulate solid thermally degraded carbohydrate tobacco substitute which is obtained by subjecting a carbohydrate to a catalysed degradation process at a temperature of at least 100°C until the weight of the degraded material is less than 90 percent of the dry weight of the original carbohydrate,
   b. a harmless filler and
   c. sufficient binder to enable the mixture to be fabricated, said filler being harmless on pyrolysis and present in a proportion of 40 to 65 percent by weight of the mixture and being selected from salts wherein the anion comprises formate, oxalate, citrate, tartrate, silicate, carbonate, chloride, sulphate, phosphate, borate, oxide, dioxide or aluminate and the cation comprises sodium, potassium, calcium, magnesium, iron or titanium, the combination of cations and anions in the filler being selected to impart a burning rate correlated to a puff number of 8–12 of a machine-made standard Class B British cigarette containing 1.1 g. tobacco, where each puff is of 25 ml. volume in two seconds, followed by a 58 second rest or smouldering period and where the 70 mm. cigarette is smoked to a butt length of 20 mm.

3,885,575

MANUFACTURE OF A SMOKING MATERIAL

James Brown Parker, and John Evan Philip Hicks, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 7, 1973, Ser. No. 386,427

Claims priority, application United Kingdom, Aug. 31, 1972, 40322/72

Int. Cl. A24b *15/00*

U.S. Cl. 131—2 **8 Claims**

1. In a process for the manufacture of a modified non-toxic carbohydrate material suitable for smoking mixtures which comprises the catalytic degradation of a carbohydrate material by impregnating said material with from 2.5 to 10% by weight of a degradation catalyst in aqueous solution followed by drying and heating until the weight of the degraded material is less than 90% of the weight of the original carbohydrate material, the improvement which comprises only partially drying the impregnated material so that the partially dried material contains from 1 to 15% by weight of water, and catalytically degrading said partially dried carbohydrate material by exposing the same to microwave energy at the rate of 100 to 300 calories for each gram of carbohydrate material until the desired degree of degradation is attained.

3,885,576

WRIST BAND INCLUDING A MERCURY SWITCH TO INDUCE AN ELECTRIC SHOCK

Eliot N. Symmes, Seattle, Wash., assignor to Habi-Chek Corporation, Campbell, Calif.

Filed Sept. 23, 1974, Ser. No. 508,453

Int. Cl. A24f *47/00*

U.S. Cl. 131—170 A **10 Claims**

1. Electrical apparatus for inducing a shock in a person in response to a movement of one of his arms comprising
   a wrist band adapted to be worn on the arm of said person,
   a source of electrical power including means for attaching said source to the clothing of said person,
   a pair of spaced electrodes attached to said wrist band and disposed to physically contact the wrist of said person,
   a mercury switch disposed on said wrist band to be opened or closed dependent upon the position thereof,
   means connecting said mercury switch to said pair of spaced electrodes,
   means connecting said source of power to said pair of spaced electrodes through said mercury switch,
   whereby the closure of said mercury switch causes current to flow from said source of power through said spaced contacts and the arm of said person upon movement thereof, to induce a shock therein when said apparatus is worn by said person.

3,885,577

HEAT-ASSISTED PERMANENT WAVING SYSTEM

Norman L. Edelberg, Des Plaines, and John R. Forsberg, Arlington Heights, both of Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Jan. 11, 1974, Ser. No. 432,597

Int. Cl. A45d *7/00*

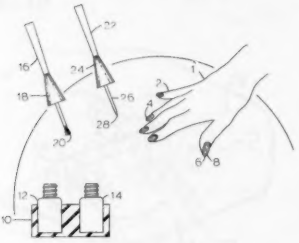
U.S. Cl. 132—7 **5 Claims**

1. In a heat-assisted method for the permanent waving of hair in which an aqueous solution containing ammonium thioglycolate is applied to hair wound around a roll to wet said hair, the wetted hair is maintained at an elevated temperature by a heated clamp holding said hair around said roll, excess ammonium thioglycolate solution is then removed and an oxidizing solution is thereafter applied to said hair to neutralize said ammonium thioglycolate solution, the improvement which comprises permitting said heated clamp to heat said wetted hair to a temperature above 120°F. and to maintain a temperature about 120°F. for no more than 6 minutes, and utilizing as said ammonium thioglycolate solution, a solution of greater strength than is used on similar hair in prior heat-assisted permanent waving and of lesser strength than is used in prior non-heat assisted permanent waving, said solution having an ammonium thioglycolate content in the range between 0.75 ± 0.05 and 9.7 ± 0.1 weight percent and having a pH in the range between 7.6 ± 0.1 and 9.35 ± 0.05.

3,885,578
FINGERNAIL DECORATING

Carolyn Colburn Hicks, 5789 Kalanianaole Hwy., Honolulu, Hawaii 96821

Filed Dec. 12, 1972, Ser. No. 314,422
Int. Cl. A45d *40/30*
U.S. Cl. 132—88.5 1 Claim

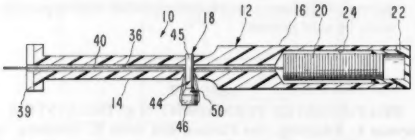


1. Fingernail coating apparatus comprising a first container, first fingernail coating material in the first container, a spreading applicator associated with the first container for spreading the first coating material over a fingernail, a second coating container means for holding a second liquid coating material, second liquid coating material in said second container means, applying means connected on the second coating holder means for applying the second coating material form the holder means to the fingernail, wherein the applying means comprises a cap-mounted shaft with a point immersed in the liquid for holding the liquid second coating material on a wall of the shaft when transferring the second coating material to the fingernail upon touching the point to the fingernail.

3,885,579
DENTAL FLOSS HOLDER

Leonard F. Navrat, 210 N. Belmont, Wichita, Kans. 67218

Filed July 18, 1973, Ser. No. 380,449
Int. Cl. A61c *15/00*
U.S. Cl. 132—92 R 3 Claims

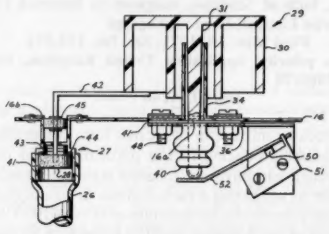


1. A dental floss holder comprising: an elongated, generally longitudinal straight body having a pair of ends and means at one end thereof for holding a spool of dental floss, there being a passage extending longitudinally through the body for guiding a stretch of dental floss from a spool of floss at said one end to the opposite end of the body, said body further having a bore intermediate its ends, said bore extending transversely of said passage and being in communication therewith, said body having an annular, beveled surface surrounding the outer end of the bore, a pair of spaced arms rigid to the body at said opposite end and extending laterally therefrom, the outer ends of the arms adapted to position a span of dental floss for insertion into the mouth and into the region between a pair of adjacent teeth; and a pin shiftably mounted within the bore for longitudinal movement relative thereto and having a transverse dimension less than a corresponding transverse dimension of the bore to permit a doubled portion of said stretch of floss from said spool to extend laterally of the passage through the bore to a location exteriorly of the body, around the outer end of the pin, then back into and through the bore and into and through said passage to said opposite end, said pin having an annular, beveled face substantially complemental to said beveled surface of said body and movable longitudinally thereof for wedging the doubled portion of said floss stretch against the body when tension is applied to the span bridging the outer ends of the arms to thereby lock the span against any substantial movement relative to said body.

3,885,580
DISHWASHER CONTROL SYSTEM

Donald S. Cushing, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 4, 1974, Ser. No. 457,837
Int. Cl. B08b *3/02*
U.S. Cl. 134—57 D 7 Claims

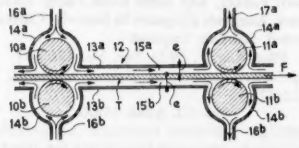


1. In a dishwasher of the type having a washing chamber, spray means contained within said washing chamber for distributing washing liquid therein, a pump in flow communication with said spray means for delivering said washing liquid to said spray means, a motor driving said pump and an electrical control circuit for regulating said motor and providing various cycles of operation of said dishwasher, the invention comprising: (a) a switch assembly operatively connected to the electrical control circuit of the dishwasher; and (b) pressure activated control means in pressure communication with the outlet of said pump adapted to operate said switch assembly in response to pressure changes at the outlet of said pump.

3,885,581
MACHINE FOR COOLING METAL SHEETS OR PLATES

Gilbert Mordekhaï Ihouda Dahan, Villepreux; Jean Schrempp, Jouy-en-Josas, and Stephane Georges Jean-Marie Viannay, Plaisir, all of France, assignors to Usinor, Paris, France

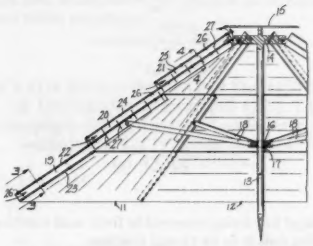
Filed Apr. 19, 1974, Ser. No. 462,580
Int. Cl. B08b *3/04*; B05c *3/132*
U.S. Cl. 134—122 12 Claims



1. A machine for cooling metal sheets or plates, comprising a casing having at least two substantially planar and substantially parallel portions in facing relation to each other and defining therebetween a gap having a width which exceeds the thickness of the sheet to be cooled so as to define two chambers with the sheet, means for supplying said chambers with a current of cooling water which moves substantially in a direction substantially parallel to the plane of the sheet, a series of parallel sheet support and guide rollers which are disposed transversely of the longitudinal direction of the sheet, said substantially planar portions being disposed between two adjacent rollers of said rollers which are located on

the same side of the sheet, the casing further comprising substantially part-cylindrical portions surrounding said rollers.

3,885,582
HEAT DISSIPATING SUNSHADE
Stanley S. Kowalski, 59 Pitt St., Bridgeport, Conn. 06606
Filed June 3, 1974, Ser. No. 475,743
Int. Cl. A45b *25/26*
U.S. Cl. 135—35 V **8 Claims**



1. A heat dissipating sunshade, comprising: first and second pairs of ribs,

each rib having a substantial vertical dimension and substantially parallel upper and lower edges;

said second pair of ribs being mounted above said first pair of ribs in terraced arrangement;

a portion of the lower edge of each second pair of ribs being fixed to a portion of the upper edge of each first pair of ribs;

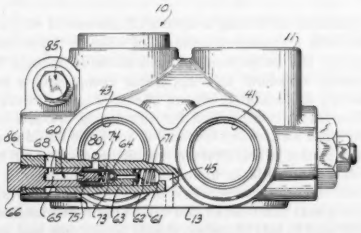
a first canopy section covering said first pair of ribs on the upper edges thereof and extending under a portion of the second pair of ribs;

a second canopy section covering a portion of said first pair of ribs on the lower edges thereof; and

a third canopy section covering said second pairs of ribs on the upper edges thereof;

whereby the faces of said first and second canopy sections are spaced apart by said first pair of ribs and the faces of said first and third canopy sections are spaced apart by said second pair of ribs to define channels therebetween for directing air upwardly when said sunshade is angularly positioned with said first pair of ribs lowermost.

3,885,583
PRESSURE COMPENSATING VALVE MECHANISM FOR HYDRAULIC CONTROL VALVES
Francis H. Tennis, Oconomowoc, Wis., assignor to Hydraulic Industries, Inc., Hartland, Wis.
Filed Apr. 22, 1974, Ser. No. 463,098
Int. Cl. F15b *13/02*
U.S. Cl. 137—115 **6 Claims**



1. In a valve mechanism having pressure fluid inlet, feed and bypass ports, and wherein flow of signal fluid into a feedback chamber causes force to be imposed on a pressure compensating valve plunger to move the same in a feed direction and thereby effect diversion of inlet fluid to the feed port, and wherein flow of inlet fluid into an inlet chamber causes force to be imposed on the plunger to move the same in a bypass direction and thereby effect diversion of inlet fluid to the bypass port, movement of the plunger in the bypass direction tending to increase the pressure in the feedback chamber and the speed of such plunger movement being dependent upon the rate at which fluid can be expelled thereby from the feedback chamber, the improvement which comprises:

A. means providing separate substantially unrestricted ducts through which inlet and signal fluid can flow rapidly to the inlet and feedback chambers, respectively;

B. a one way valve arranged to open under signal fluid pressure to allow signal fluid to flow to the feedback chamber;

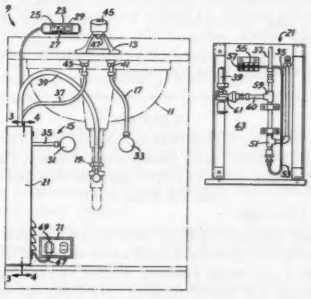
C. means defining a restricted first venting passage which connects with the feedback chamber and is at all times effective to damp pulsations of moderate pressure therein such as occur during normal modulating operation of the plunger;

D. means defining a substantially unrestricted second venting passage connecting with the feedback chamber to provide for rapid flow of fluid therefrom;

E. a fluid pressure actuatable valve member governing fluid flow through said second venting passage, said valve member being movable to a passage open position under force which pressure fluid in the feedback chamber imposes thereon;

F. and means to yieldingly hold said valve member in its passage closing position against opening forces which said moderate pressure pulsations impose thereon while allowing the valve member to be opened in consequence of higher pressures in the feedback chamber resulting from movement of the plunger in the bypass direction, said last named means comprising a surface on the valve member upon which signal fluid exerts passage closing force.

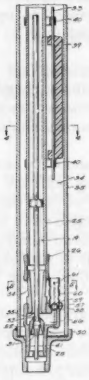
3,885,584
HOT WATER SYSTEM
Walter L. Hock, 7539 Kolmar Ave., Skokie, Ill. 60076
Filed Jan. 7, 1974, Ser. No. 431,357
Int. Cl. F16k *19/00*
U.S. Cl. 137—115 **5 Claims**



1. A hot water system comprising a drain, a hot water line, a faucet having a given flow capacity and disposed in said line, a valve disposed in said line ahead of said faucet and arranged to cause water in said line to bypass said faucet and be discharged directly to said drain from said line when said valve is open, said valve being electrically operated and having a flow capacity greater than that of said faucet, a manually actuated switch for selectively causing the opening of said

valve, means for sensing the temperature of the water in said line, control

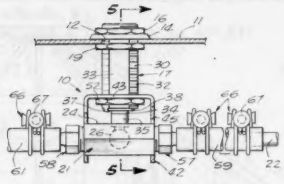
3,885,585
YARD HYDRANT
John H. Carpentier, Fort Atkinson, Wis., assignor to Whitewater Mfg. Co., Whitewater, Wis.
Filed Dec. 4, 1972, Ser. No. 312,160
Int. Cl. E03b 9/08, 9/14
U.S. Cl. 137—282 10 Claims



1. In a yard hydrant having a spout, a valve located below the frost line, a reservoir located below the frost line, a passage connecting the valve to the spout, and reservoir regulating means connecting said passage with said reservoir to drain said passage into said reservoir when said valve is closed and to withdraw water from said reservoir into said passage only when said valve is open, said valve including a valve seat and a complementary valve closure member, said valve seat and said valve member comprising the converging cone of a venturi in said passage, said venturi having a throat open to said reservoir regulating means, said valve member being secured to a valve rod extending through said valve seat, said valve rod, valve member and valve seat cooperating to form a variable opening annular jet orifice for water passing through said valve, said orifice being smaller at smaller valve openings, whereby to create an area of lowered pressure around said jet at substantially all valve openings.

3,885,586
KEY ACTUATED LOCKING VALVE
Rodney B. Tibbetts, 9210 Stamp Ave., Downey, Calif. 90240
Filed Aug. 23, 1973, Ser. No. 390,683
Int. Cl. F16k 35/06
U.S. Cl. 137—354 4 Claims

1. A key actuated locking valve device comprising a valve body having hexagonally shaped cross sectional end portions and an inlet and outlet opening, a valve ball having a passage therethrough and seated in said valve body for rotation between an open position in which said inlet and outlet opening is connected and a closed position, said valve ball having a coupling element on the upper end thereof extending through an access opening on said valve body, a tumbler lock including a barrel having flats thereon and threads along the length thereof, a cylindrical plug in said barrel having its lower end extending into the access opening on said valve body and adapted to engage the coupling element on said valve ball, a bracket having a top member and spaced depending side members, said top member having an opening therein with straight sides for engaging the flats on said barrel and said depending side members each having an hexagonal opening therein for engaging a respective end portion of said valve body, a nut on said barrel for retaining said bracket on said barrel and thereby holding the lower end of said plug engaged to the coupling element on said valve ball, and a key for rotating said plug relative to said barrel and thereby rotating said valve ball between said open and closed position in said

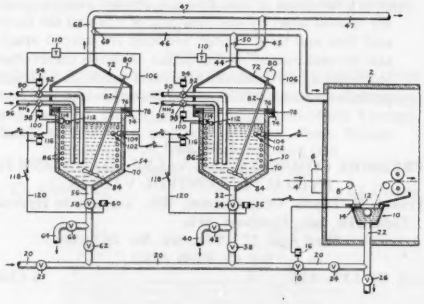


valve body, said key being removable from said tumbler lock when the valve ball is in its closed position.

3. The invention in accordance with claim 1 wherein the upper end of said barrel extends through an opening provided in the floor pan of the driver's compartment of a motor vehicle, and, including

an upper and lower nut on said barrel for engaging the upper end of said barrel on said floor pan.

3,885,587
APPARATUS FOR MIXING VOLATILE LIQUID WITH NONVOLATILE MATERIAL
Walter S. Troope, Latham, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.
Division of Ser. No. 854,542, Sept. 2, 1969, abandoned. This application Mar. 9, 1972, Ser. No. 234,442
Int. Cl. B01f 15/04
U.S. Cl. 137—391 9 Claims



1. Apparatus for mixing a measured amount of nonvolatile material with a measured amount of volatile liquid and for maintaining the proportion of said material in said liquid substantially constant, said apparatus comprising a mixing tank having an insulated mixing chamber and a cover over said chamber, a coolant coil for circulating coolant in said chamber, first feed means for feeding a volatile liquid into said chamber, a valve in said first feed means, a second feed means for feeding a nonvolatile material into said chamber, a valve in said second feed means, a first float in said chamber, means connecting said first float to said valve in said first feed means, a second float in said chamber, means connecting said second float to said valve in said second feed means, means for discharging the mixture of said measured amount of nonvolatile material and said measured amount of volatile liquid from said mixing tank after said measured amounts have been mixed

therein, valve means in said discharge means, means connected to said valve means in said discharge means for opening and closing said discharge valve means, said means for opening and closing said discharge valve means including means for opening said valve in said first feed means when said discharge valve means is closed and for closing said valve in said first feed means when said discharge valve means is opened, said first float in said chamber including means for closing said valve in said first feed means when the liquid in said chamber lifts said first float and for opening said valve in said first feed means when the liquid in said chamber is below the level to lift said float.

3,885,588

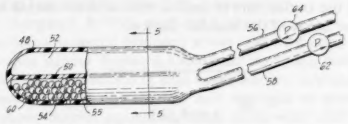
DEVICE FOR REMOVING WATER FROM THE BOTTOM OF UNDERGROUND LIQUID FUEL TANKS

Albert Shotmeyer, 46 Westerly Rd., Saddle River, N.J. 07506

Filed Sept. 12, 1973, Ser. No. 396,576

Int. Cl. B67d *5/60*

U.S. Cl. 137—565 **5 Claims**



1. A device for removing the water from the bottom of an underground liquid fuel containing tank having a body of water below the fuel therein, comprising: a collapsible flexible hollow container having at least one perforation through a wall thereof, a flexible tubular conduit connected at one end with said container and communicating with the interior thereof; and a suction means connected with the other end of said tubular conduit;

means within said container having a specific gravity greater than that of the fuel and water within the tank, said means within said container comprising particulate matter having a minimum cross section greater than that of the perforation in said container wall and less than that of the tubular conduit, said particulate matter comprising a material that is insoluble in any liquid fuel or water within a fuel tank in which it is to be immersed.

3,885,589

COCK AND PRESSURE-REDUCER UNIT FOR LIQUEFIED-GAS RESERVOIRS

Jacques Iung, Pontarlier, France, assignor to Gurtner S.A., France

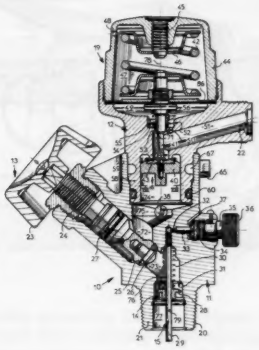
Filed May 16, 1973, Ser. No. 360,918

Claims priority, application France, May 18, 1972, 72.17880

Int. Cl. F16k *21/00*

U.S. Cl. 137—613 **11 Claims**

1. Cock and pressure-reducer unit for connecting a source of liquefied gas under pressure to a gas distribution network after reducing the pressure of the gas, said cock and pressure-reducer unit comprising first and second bodies, a flow-limiting device, a stop cock having a closed position preventing flow and an open position permitting flow, a pressure-reducing device having a pressure-reducing chamber, a seat in the latter chamber and valve means acting with said seat, said valve means being controlled by a manometric control chamber acted upon by the pressure of the gas at the inlet into the distribution network, and a maximum level gauge, wherein the aforesaid components are so arranged with respect to one another that gas proceeding from the source and supplied to a network passes successively through the flow-limiting device, the stop cock and the pressure-reducing device, said flow-limiting device and said stop cock being mounted on said first body, and the pressure-reducing device and its control chamber being mounted on said second body, said second body being fitted sealingly into said first body and being removably connected thereto, whereby said stop cock may be



placed in its closed position to permit said second body to be removed, as required, without flow of gas beyond said stop cock.

3,885,590

GAS TRANSMISSION AND MONITORING DEVICE

John L. Ford, and John Serafin, both of Phoenix, Ariz., assignors to Serefor Industries, Inc., Phoenix, Ariz.

Filed May 10, 1974, Ser. No. 468,653

Int. Cl. G05d *11/00;* **F16k** *45/00*

U.S. Cl. 137—613 **1 Claim**

1. A compact, self-contained flow and pressure regulator device having manual and automatic safety means for monitoring gas transmission from a source of compressed gas to a human body cavity during a peritoneoscopy, said regulator device comprising:

a. a housing having an inlet and an outlet and a gas transmission conduit communicating therebetween,

said inlet adapted for connection to a source of pressurized gas,

said outlet adapted for connection to a gas delivery conduit;

b. a selectively adjustable pressure regulator proximate the inlet end of said gas transmission conduit for modulating the pressure of said gas entering said conduit from said pressurized source;

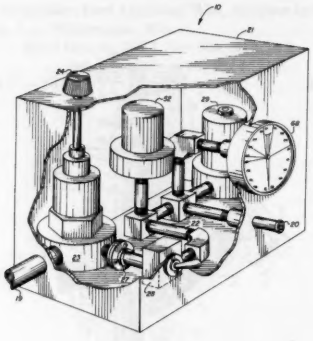
c. a limiting orifice for receiving said gas from said adjustable pressure regulator and reducing the flow of said gas to a predetermined rate;

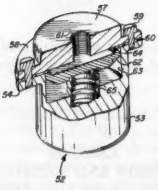
d. a control valve downstream of said adjustable pressure regulator and said limiting orifice for maintaining said gas below a predetermined rate of flow and pressure;

e. a relief valve operatively associated with said gas transmission conduit between said orifice and said outlet for the escape of gas therethrough when the gas in said conduit exceeds a predetermined maximum pressure or flow rate,

said relief valve opening in response to a pressure and flow rate which is higher than the values maintained by said control valve;

f. gauge means for indicating gas conditions in said gas transmission conduit; and





g. valve means for selectively discontinuing the discharge of gas from said outlet.

3,885,591

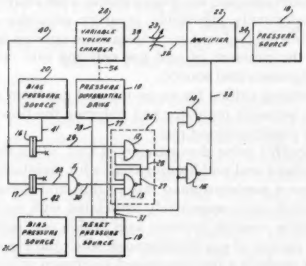
TUNABLE FLUIDIC OSCILLATOR

Robert F. O'Keefe, Trumbull, Conn., assignor to Automatic Switch Company, Florham Park, N.J.

Filed June 14, 1973, Ser. No. 370,121

Int. Cl. F15c *3/04*

U.S. Cl. 137—826 **5 Claims**



1. A fluidic oscillator, comprising:

a. a fluidic bistable device having two input ports and an output port;

b. a volume chamber;

c. means for charging the volume chamber when the output of the bistable device is in a first binary state and discharging the volume chamber when the output is in a second binary state; and

d. means, coupling the volume chamber to the input ports, for changing the output of the bistable device from the first state to the second state when pressure in the volume chamber rises above a predetermined level and for changing the output of the bistable device from the second state to the first state when pressure in the volume chamber drops below another predetermined level, whereby the states at the output port change periodically, said means coupling the volume chamber to the input ports including first and second isolator means each having an inlet port and an outlet port, means for applying a pressure at the predetermined level to the inlet port of the first isolator means, means for applying pressure at said another predetermined level to the inlet port of the second isolator means, and means coupling the outlet port of said first isolator means to one of the inputs of the bistable device and the outlet port of said second isolator means to the other input of the bistable device.

3,885,592

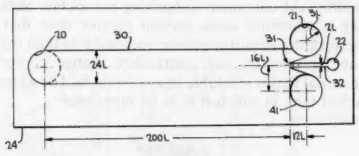
PURE FLUID PASSIVE SQUARE FUNCTION GENERATOR

Tadeusz M. Drzewiecki, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1973, Ser. No. 405,728

Int. Cl. F15c *4/00*

U.S. Cl. 137—842 **6 Claims**



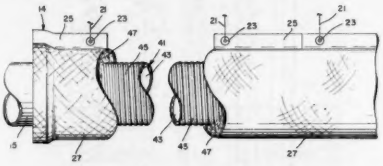
1. A passive fluidic function generator for generating an output pressure signal which is proportionally related to the square of an input pressure signal, said generator comprising in combination; input port means for connection to an input fluid pressure signal source; linear fluidic resistor means connected to said input port means for transmitting a pressure signal therethrough; a fluidic catcher means for catching and receiving the pressure signal as it exits said linear fluidic resistor means, said linear fluidic resistor means being connected directly to said fluidic catcher means to form a passage of uniform cross-section between said input port means and said fluidic catcher means; at least one vent to the ambient disposed between said fluidic resistor means and said catcher means; means defining a fluidic stagnation plenum connected to said catcher means for stagnating the pressure signal exiting said linear fluidic resistor means; and an output port means coupled to said stagnation plenum means for providing an output pressure signal, said output pressure signal being functionally related to the square of the input pressure signal.

3,885,593

STRETCHABLE REINFORCED WRAPPER FOR INSULATED FLEXIBLE DUCT

Marvin A. Koerber, Abbeville, and Charles G. Richitelli, Greenwood, both of S.C., assignors to Automation Industries, Incorporated, Los Angeles, Calif.

Filed Dec. 18, 1972, Ser. No. 316,023
Int. Cl. F16l *11/12*
U.S. Cl. 138—128 27 Claims



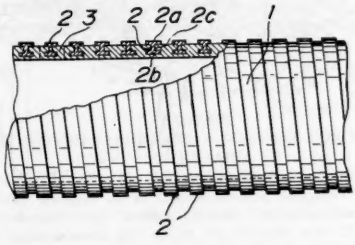
3. An insulated flexible duct, comprising:
an elongated, helical, semi-rigid, wire core;
insulating material disposed about said wire core;
a vapor barrier disposed about said insulating material;
reinforcement means in said vapor barrier, said reinforcing means being constructed and arranged to protect said vapor barrier against rips and tears while still allowing circumferential stretching of said vapor barrier,
said vapor barrier including at least one moisture and air impervious film with inherent elongation in both axial and circumferential directions, and
said reinforcement means includes reinforcement material arranged to increase the durability, strength and puncture and tear-resistance of said vapor barrier without the loss of axial elongation thereof.

3,885,594

REINFORCED FLEXIBLE PIPE

Kenichi Tanaka, Tokyo, Japan, assignor to Kakuichi Mfg. Co., Ltd., Ueda, Japan

Continuation of Ser. No. 240,209, March 31, 1972, abandoned. This application May 20, 1974, Ser. No. 471,807
Claims priority, application Japan, Jan. 17, 1972, 47-6204; Jan. 17, 1972, 47-6205; Jan. 27, 1972, 47-9434
Int. Cl. F16l *11/08*
U.S. Cl. 138—129 4 Claims



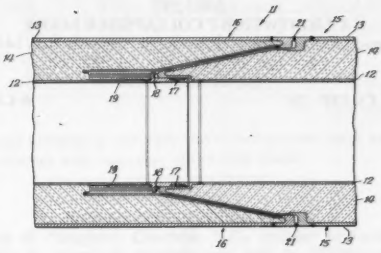
1. A reinforced flexible pipe comprising a tubular wall formed of a soft synthetic resin material, and a reinforcing spiral core of a hard synthetic resin material having a substantially I-shaped cross-section and extending throughout the length of said pipe, partly exposed out of said wall and intimately bonded thereto, the adjoining lateral edges of an elongated strip being welded together in abutting relation so as to integrally form said wall, said strip being formed of a soft synthetic resin material and of a reinforcing hard synthetic resin material core extending throughout the length of said strip and having a substantially I-shaped cross-section and being partly exposed out of said strip.

3,885,595

CONDUIT FOR CRYOGENIC FLUID TRANSPORTATION

Clarence John Gibson, and Kenneth Kimble, both of El Cajon, Calif., assignors to Kaiser Aerospace & Electronics Corp., Oakland, Calif.

Filed Jan. 28, 1974, Ser. No. 437,250
Int. Cl. F16l *9/22, 51/00*
U.S. Cl. 138—155 5 Claims



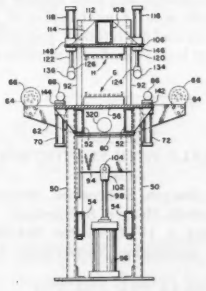
1. A conduit section for use in a cryogenic fluid carrying conduit formed from a plurality of said sections, said conduit section having at its opposite ends a first end portion and a second end portion, said end portions being telescopable into and connectible to end portions of like conduit sections to thereby form a cryogenic fluid carrying conduit, said conduit section having an inner pipe portion and a concentric outer pipe portion with thermal insulation therebetween, the said first end portion being frusto-conical, and said second end portion having a motion compensator secured thereto, said motion compensator being exposed only to external pressure when said conduit sections are connected together, and providing a gas or liquid cryogen seal while elastically compensating for relative motion between said outer and inner pipe portions due to temperature differences between said portions.

3,885,596

FABRIC SPLICE APPARATUS

Alexander V. Alexeff, Cleveland, Ohio, assignor to Alexeff-Snyder Enterprises, Inc., Cleveland, Ohio

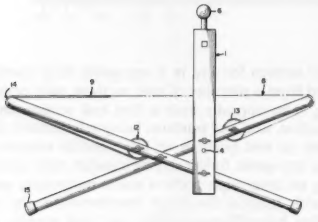
Filed July 5, 1973, Ser. No. 376,537
Int. Cl. D03d *41/00;* B65h *69/06*
U.S. Cl. 139—28 22 Claims



1. Apparatus for splicing overlapped fabric end portions defining a fabric double layer having a longitudinal axis and a lapping plane comprising; clamping means for transversely clamping said double layer in longitudinally-spaced locations, loop forming means on opposite sides of said double layer intermediate said clamping means for forming a plurality of loop rows in said double layer spaced-apart parallel to said

longitudinal axis with each row having a plurality of loops extending alternately in opposite directions out of said plane transversely of said axis and with adjacent loops in adjacent loop rows extending in opposite directions out of said plane, and rod inserting means for inserting elongated substantially rigid rods in each of said loop rows.

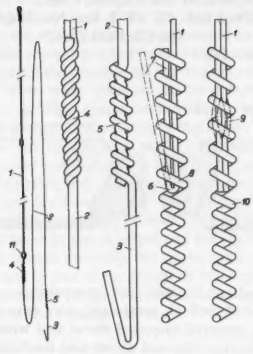
3,885,597
A LIGHTWEIGHT COLLAPSIBLE LOOM
Mildred Elizabeth Hines, 72 Second St., Geneseo, N.Y. 14454
Filed Apr. 19, 1973, Ser. No. 352,700
Int. Cl. D03d *29/00*
U.S. Cl. 139—29 **6 Claims**



1. A lightweight, collapsible loom comprising two U-shaped members each having a pair of spaced legs connected by a transverse base portion, said members being arranged so that one leg of one member is positioned adjacent one leg of the other member, the adjacent legs of said members being pivotally joined at their mid-sections, a shedding mechanism including a pair of rigid uprights each of which extends transversely of and substantially intersects adjacent legs of said members, means for connecting each upright to each of said adjacent legs at their area of intersection to form a stable triangular brace, warp and cloth rollers, and means for mounting said rollers on at least one of said members.

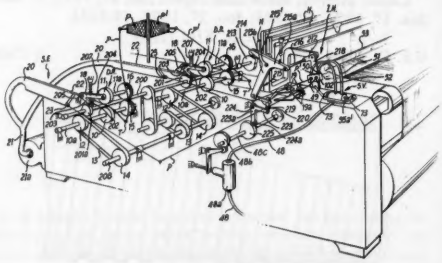
3,885,598
JACQUARD HEALD WITH ELASTIC RETRACTING CORD
Erich Vogelbacher, Horgen, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland
Filed Aug. 1, 1973, Ser. No. 384,540
Claims priority, application Switzerland, Aug. 4, 1972, 11580/72
Int. Cl. D03c *3/44, 9/04*
U.S. Cl. 139—89 **2 Claims**

1. In the combination of a Jacquard heald and a fastening element coupled by an elastic retraction cord connected at its one end to the heald and at its other end to the fastening element, the improvement characterized by the connections between the heald and the elastic cord and the fastening element and the elastic cord being made by spaced helical wire spirals which coil around and entwine the ends of the elastic cord, the inside diameter of the spirals being smaller than the outside diameter of the elastic cord, wherein the



spirals are formed by the ends of the heald and the fastening element.

3,885,599
SHUTTLELESS WEAVING LOOMS
Thomas Blackburn Mawdsley, and Albert Whittle, both of Chorley, England, assignors to Carrington Viyella Limited, Chorley, Lancashire, England
Continuation of Ser. No. 201,431, Nov. 23, 1971, abandoned.
This application Oct. 1, 1973, Ser. No. 402,276
Int. Cl. D03d *47/34, 47/28*
U.S. Cl. 139—127 P **13 Claims**



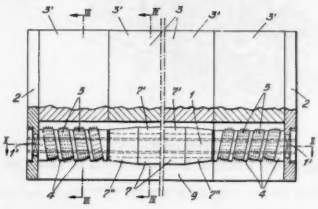
1. A fluid jet loom including a weft yarn supply means, weft yarn feed means comprising a weft drive roll means including pairs of drive rolls, each pair having a weft yarn therebetween, separate means continuously driving each pair of said drive rolls, storage means for each said weft yarn and weft insertion means for each said weft yarn, said storage means being arranged between said weft drive roll means and said weft insertion means, selective control means operatively connected to each pair of drive roll means and operative on signal to cause selected drive rolls to drivingly engage said weft yarn or to become separated so as not to feed said weft yarn, whereby weft yarn may be fed intermittently or continuously by said weft drive roll means to said storage means.

3,885,600

METHOD AND TEMPLE APPARATUS FOR GUIDING FABRIC LENGTHS THROUGH TEXTILE WEAVING MACHINES

Jack G. Altmann, Kirchenrainstrasse 21, CH-8630 Tann-Ruti, Switzerland

Filed July 17, 1973, Ser. No. 380,184
Int. Cl. D03j *1/22*
U.S. Cl. 139—292 **2 Claims**



1. A structure for guiding and expanding a continuous length of fabric through a textile machine comprising means operative to selectively pinch the fabric over its full width between the selveges to guide said fabric and to hold it in place, said structure being further operative to periodically release said pinching action while said length of fabric is being pulled thereby to effect transport of said fabric, and being operative to positively stretch said fabric outwardly in opposing directions at its selveges while said fabric is being transported and thereafter to repinch the fabric over its full width between the selveges to terminate said transport, said structure comprising a temple which includes an elongated guiding and tensioning element mounted for rotation within a housing, said guiding and tensioning element including a radially free-floating and freely rotatable tubular portion positioned across the full width of said fabric between its selveges and adapted to move in a radial direction toward and into engagement with a portion of the housing to selectively pinch the fabric therebetween, and said element further including two temple cylinder sections positioned at opposite ends of said free-floating and freely rotatable tubular portion and having oppositely inclined pinned temple rings respectively disposed in the selvege zones of the fabric so that the pins thereof penetrate through the selveges and thereby, due to the opposing inclinations of the temple rings, stretch the fabric outwardly weftwise during the free rotation of said tubular portion without relative gliding of the fabric over said tubular portion or temple rings.

3,885,601

KNIT-WOVEN FABRIC AND A MACHINE FOR MAKING THE SAME

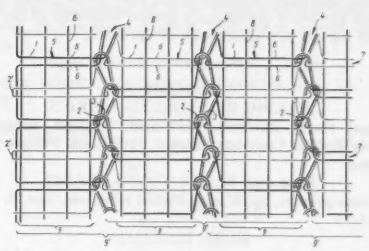
Josef Zmatlik; Miloslav Jisa, both of Liberec, and Josef Mohelnicky, Prague, all of Czechoslovakia, assignors to Statni Vyzkumny ustav Textilni, Liberec, Czechoslovakia

Continuation-in-part of Ser. No. 246,239, Apr. 21, 1972, Pat. No. 3,746,051. This application Feb. 6, 1973, Ser. No. 330,044

Claims priority, application Czechoslovakia, Apr. 23, 1971, 2981-71; Jan. 14, 1972, 251-72; Jan. 19, 1972, 343-72; Feb. 8, 1972, 775-72

Int. Cl. D03d *25/00*
U.S. Cl. 139—383 R **1 Claim**

1. A knit-woven fabric, comprising a warp-knitted structure having wales of double stitches spaced across the width of the fabric formed by weft threads and consisting of closed reverse stitches doubled by open not reverse stitches, and longitudinal woven stripes located between said wales and formed by warp threads interlaced with double weft threads composed of connecting loops of closed reverse stitches and of connecting loops of open not reverse stitches, each pair of said weft



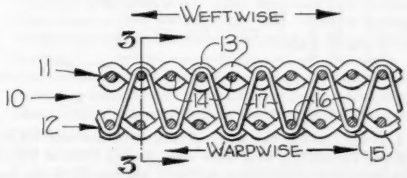
threads forming in one wale one closed reverse stitch and in an adjacent wale one open not reverse stitch.

3,885,602

WOVEN FOURDRINIER FABRIC

Philip H. Slaughter, Charlotte, N.C., assignor to Evans S. Creech; Jimmie O. Hutchins and John W. Whitley, all of Charlotte, N.C., part interest to each

Filed Nov. 21, 1973, Ser. No. 417,873
Int. Cl. D03d *15/00, 15/02;* **D21f** *1/10*
U.S. Cl. 139—425 A **8 Claims**



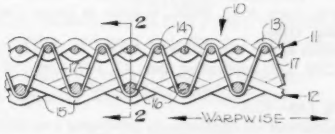
1. A Fourdrinier fabric comprising at least two woven plies of respective sets of weft yarns and warp yarns, binder warp yarns interwoven with and interconnecting said two plies, and each of said plies being in the form of a mesh weave having an open area of at least about 9% per square inch thereof.

3,885,603

PAPERMAKING FABRIC

Philip H. Slaughter, Charlotte, N.C., assignor to Evans S. Creech; Jimmie O. Hutchins and John W. Whitley, all of Charlotte, N.C., part interest to each

Filed Nov. 21, 1973, Ser. No. 417,872
Int. Cl. D03d *15/00, 15/02;* **D21f** *1/10*
U.S. Cl. 139—425 A **13 Claims**



1. A multi-ply woven fabric of mesh construction for use as a Fourdrinier forming belt and especially constructed to permit drainage therethrough of liquid from a slurry received thereon and to withstand flexing, high tension and abrasion incident to paper manufacture, said fabric comprising at least two plies each having an open area of at least about 9 percent and each ply being formed of respective interwoven warp and weft yarns, binder warp yarns interwoven with and interconnecting said plies, said plies including a top ply and a bottom ply, and said top ply being formed of a considerably greater number of warp yarns and weft yarns per square inch than said

bottom ply with at least the warp yarns in said top ply being substantially smaller than the warp yarns in said bottom ply, and the aggregate cross-sectional area of the yarns in said bottom ply being substantially greater than that of the yarns in said top ply per square inch of the fabric.

3,885,604

MAKING REINFORCED FABRICS

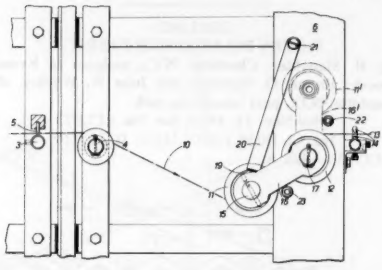
Kenneth Harry Rowland, Melksham, England, assignor to Avon Rubber Company Limited, Melksham, Wiltshire, England

Filed Apr. 5, 1974, Ser. No. 458,349

Claims priority, application United Kingdom, Apr. 9, 1973, 16945/73

Int. Cl. B21f *23/00*

U.S. Cl. 140—3 C **11 Claims**



1. In the combination of creel rack and a machine for drawing and embedding wire from wire storage reels in the creel rack to form a wire-reinforced fabric wherein there are means for exerting tension on the wires the improvement comprising a tensioning device placed in the wire path between the creel rack and the machine and tensioning in common a plurality of the wires, the tensioning device including a pair of spaced-apart grooved rollers each having an abrasion-resistant surface of uniform diameter in the grooves, the plurality of wires running around each roller on its surface over a part of the periphery thereof, each of the wires occupying one groove, all the grooves of each roller respectively being constrained to rotate in common, such that the wires execute a double bend in their path and drive the rollers against their resistance to rotation without slippage between any wire and the rollers.

3,885,605

HELICAL COIL FORMING MACHINE

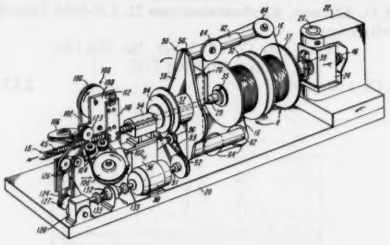
Ernest U. Lang, Niles, Mich., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 343,617, March 21, 1973, Pat. No. 3,823,590. This application Mar. 22, 1974, Ser. No. 453,748

Int. Cl. B21f *3/00*

U.S. Cl. 140—92.6 **2 Claims**

1. Apparatus for continuously producing a nonrotating coil having helical wire turns of substantially uniform diameter, comprising means for rotatably supporting a plurality of wire supply rolls positioned in tandem relation, a coil forming rotor including means for receiving a wire from each of the wire supply rolls and for deforming the wires beyond their elastic limit into interfitting continuous wire turns, means for supporting said rotor for rotation on an axis substantially aligned with the axis of rotation of the wire supply rolls, means for rotating said rotor, means on said rotor for directing the wires from the corresponding wire supply rolls to said wire deforming means, means for guiding the coil axially from said rotor after the coil is formed by rotation of said rotor, means for feeding the wire coil from said rotor as the coil is being formed, and means for varying the speed of said feeding



means relative to the speed of rotation of said rotor to provide for changing the pitch of the wire turns of said coil.

3,885,606

MOVEABLE LOADING APPARATUS FOR FINE GRANULAR AND PULVERIZED LOOSE SOLIDS

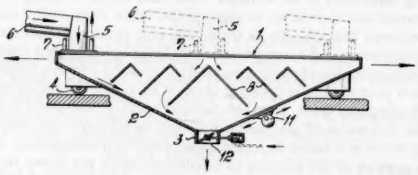
Werner Krauss, Hamburg, Germany, assignor to Claudius Peters A.G., Hamburg, Germany

Filed Feb. 1, 1973, Ser. No. 328,620

Claims priority, application Germany, Feb. 4, 1972, 2205203

Int. Cl. B65b *1/20, 1/22*

U.S. Cl. 141—71 **10 Claims**



1. In a loading apparatus for granular or pulverulent material including a moveable hopper having downward sloping bottom sheets adjacent an outlet and arranged to deliver material from a feedspout to a variable-position receiver, the improvement comprising de-aerating means associated with said hopper, said de-aerating means including a plurality of baffles within the hopper and positioned on downward sloping planes intersecting the plane of the downward sloping bottom sheets.

3,885,607

DEVICE FOR PROVIDING FLUID COMMUNICATION BETWEEN TWO SEALED VESSELS

Richard I. Peltier, 2148 Painted Post Dr., Flushing, Mich. 48433

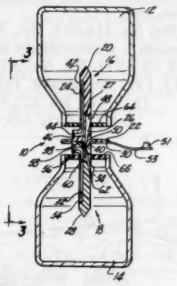
Filed Nov. 16, 1973, Ser. No. 416,404

Int. Cl. B65d *47/12;* **B67d** *3/04;* **B67c** *3/26*

U.S. Cl. 141—329 **12 Claims**

1. A device for providing fluid communication between two sealed vessels, comprising: a first cannula member, said first cannula member having an air passageway and a liquid passageway, said passageways extending longitudinally wherein one end of said air passageway is longitudinally displaced from the corresponding end of said liquid passageway; a second cannula member, said second cannula member having an air passageway and a liquid passageway, said passageways of said second cannula member extending longitudinally wherein one end of said air passageway is longitudinally displaced from the corresponding end of said liquid passageway; means for removably connecting said first cannula member to said second

cannula member with said liquid passageways in registry whereby the liquid passageway of said first cannula member



communicates with the liquid passageway of said second cannula member.

3,885,608

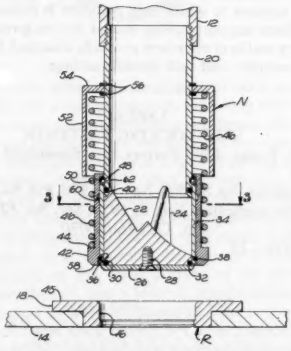
FLUID COUPLING APPARATUS

David B. Ayres, 4633 West M-12, Quartz Hill, Calif. 93534

Filed Feb. 2, 1973, Ser. No. 329,004

Int. Cl. B65b *3/04*

U.S. Cl. 141—354 **4 Claims**



1. A fluid coupling member, as for use on a hose for passing a fluid stream through said hose to a port in a receptacle, comprising:

a central cylinder adapted to be connected to a terminal end of a hose;

an end closure means affixed in axially-aligned, spaced-apart relationship to said central cylinder, defining radial open space therebetween;

a sealing member of cylindrical configuration disposed concentrically with said central cylinder for movement between one position to close said open space and another position telescoped over said central cylinder;

bias means for urging said sealing member to said one position to close said open space;

a sequence ring telescopically positioned over said sealing member; and

an engaging mechanism controlled by the position of said sequence ring including a locking means for locking said sealing member in said one position until said sequence ring is displaced by engagement with a port in a receptacle, and thereupon for locking said sealing member for movement with said sequence ring in relation to said central cylinder whereby said radial open spaced is opened.

3,885,609

COOLED ROTOR BLADE FOR A GAS TURBINE

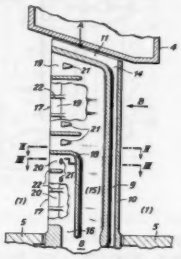
Oskar Frei, Burgstrasse 84, 8404 Winterthur, and Dilip Mukherjee, Walkerstrasse 31, 8400 Winterthur, both of Switzerland

Filed Jan. 18, 1973, Ser. No. 324,780

Claims priority, application Switzerland, Jan. 18, 1972, 00698/72

Int. Cl. F01d *5/18*

U.S. Cl. 416—97 **3 Claims**



1. A cooled rotor blade for a gas turbine comprising

a one-piece rotor blade body having a blade front, a trailing edge and a blade tip at one radial end extending from said blade front to said trailing edge, said blade tip having a trough-shaped indentation extending longitudinally therein;

means defining a first flow path through said blade body extending immediately downstream of and parallel to said blade front and terminating in said trough-shaped indentation;

a first coolant exit in said blade body in the zone of said trailing edge, said exit being in communication with said trough-shaped indentation on the suction side of said body for the passage of coolant therethrough; and

means defining a second flow path and a third path through said blade body, each of said second and third flow paths having a portion parallel to said first flow path and including portions for deflecting respective flows of coolant 90° therein; a second coolant exit in communication with said second flow path and a third coolant exit in communication with said third flow path, each of said second and third coolant exits being disposed over a part of the height of said blade body in the zone of said trailing edge on the pressure side of said body.

3,885,610

TREE HARVESTING DEVICE FOR HYDRAULIC OPERATION

Erik Torsten Forslund, and Bo Emil Fredrik Morenius, both of Alfta, Sweden, assignors to Ostbergs Fabriks AG, Alfta, Sweden

Filed Oct. 10, 1973, Ser. No. 405,009

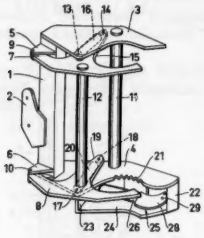
Claims priority, application Sweden, Oct. 17, 1972, 13363/72

Int. Cl. A01g *23/08*

U.S. Cl. 144—34 R **3 Claims**

1. Tree harvesting device for hydraulic operation, with a vertical frame supporting at the top and at the bottom the ends of a pair of fixed upper and lower grip arms as well as a pair of movable grip arms for gripping a tree trunk, characterized in that a cutting-off means in the form of a guide provided with a supporting holder and a chain saw is located under the said lower fixed grip arm, said holder being pivoted near the outer end of the fixed arm, so that the guide from a position covered by said fixed arm can be swung outwards in direction from the inner end of the fixed grip arm for engagement with a tree trunk bearing against said part,

said device further including a resilient returning device inserted between the holder of the cutting-off means and a fixed point located on the said lower fixed arm, a wire extending from a point on the lower moveable grip arm passing a guiding point on the adjacent fixed grip arm and



ending at a point on said supporting holder spaced from its journal axis, whereby when bringing the grip arms together, said wire is tightened for limitation of the maximum swinging-out of the cutting-off means in dependence of the diameter of the gripped tree trunk.

3,885,611

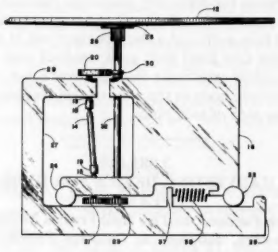
MATERIAL SHAPING PLATFORM WITH MULTIPLE OR EXCHANGEABLE TEMPLATES

Friedrich Peter Schell, Las Vegas, Nev., assignor to Revolution, Inc., Las Vegas, Nev.

Division of Ser. No. 214,007, Dec. 30, 1971, Pat. No. 3,797,543, which is a continuation-in-part of Ser. Nos. 129,507, March 30, 1971, Pat. No. 3,739,826, and Ser. No. 198,727, Nov. 15, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 422,796

Int. Cl. B27c *5/06*

U.S. Cl. 144—145 R **6 Claims**



1. A device for guiding a material workpiece to be shaped by a stationary working tool comprising:

a. a rotatable and reciprocating platform for securing a material workpiece,

b. a template cooperating with and adjacent said platform,

c. a guide member having a surface abutting said template, and

d. biasing means cooperating with said platform for constantly maintaining said template and said guide member in abutment while said working tool acts on said material workpiece,

wherein said template comprises a plurality of surfaces, the shape of which are to be reproduced on said material workpiece said template selectively attached to an upper or lower surface of said platform.

3,885,612

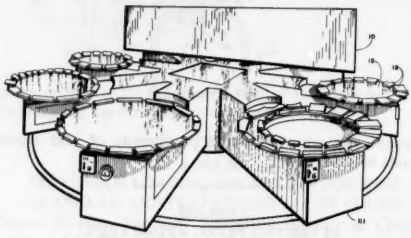
MATERIAL SHAPING PLATFORM WITH MULTIPLE OR EXCHANGEABLE TEMPLATES

Friedrich Peter Schell, Las Vegas, Nev., assignor to Revolution, Inc., Las Vegas, Nev.

Division of Ser. No. 214,007, Dec. 30, 1971, Pat. No. 3,797,543, which is a continuation-in-part of Ser. Nos. 129,507, March 30, 1971, Pat. No. 3,739,826, and Ser. No. 198,727, Nov. 15, 1971, abandoned. This application Dec. 10, 1973, Ser. No. 422,926

Int. Cl. B27c *5/06*

U.S. Cl. 144—145 R **1 Claim**



1. A device for guiding a material workpiece to be shaped by a working tool comprising a rotatable platform for mounting said workpiece thereon, a pivotal platform carriage, a platform support to which said platform is rotatably secured said platform support having means for reciprocating travel therealong and arm members pivotally attached between said platform support and said pivotal carriage.

3,885,613

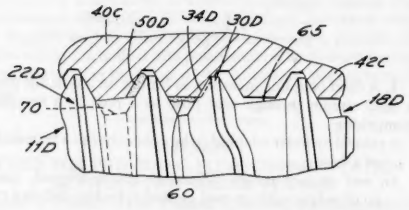
SELF-LOCKING FASTENER

Robert J. Evans, 1307 Porters Ln., Bloomfield Hills, Mich. 48013

Division of Ser. No. 88,008, Nov. 9, 1970, Pat. No. 3,721,283. This application Feb. 5, 1973, Ser. No. 329,677

Int. Cl. F16b *39/30*

U.S. Cl. 151—22 **5 Claims**



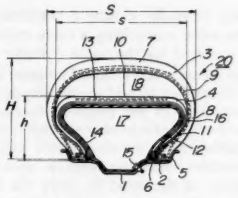
1. A self-locking male member having a generally helical male thread, a female member having a generally helical preformed female thread mating with said male thread, said male thread having in at least a partial convolution adjacent its entering end a swaging flank portion which is modified relative to the corresponding flank portions of convolutions of said male thread more remote from said entering end by being offset toward the flank portion which it confronts and hence spaced therefrom a distance less than the distance between confronting flank portions of said more remote convolutions, said swaging flank portion being offset sufficiently to have positive interference with the opposing flanks of said female thread upon entry of said male member and to displace such opposing flank material toward the crest of said female thread, the root of said male thread in said more remote convolutions and at the base of said swaging flank portion being sufficiently

less in diameter prior to assembly than the crest of said female thread that in assembly there is a clearance between said crest of said female thread and said root of said male thread in said more remote convolutions and at the base of said swaging flank portion for the receipt of such displaced material, said male member having a raised root forwardly of said swaging flank portion which is of greater diameter than the root of said male thread in said more remote convolutions and at the base of said swaging flank portion adapted, upon withdrawal of said male member, to swage said displaced female thread material back along the flanks of said female thread.

3,885,614
SAFETY TIRE

Akira Fujikawa, and Takashi Takusagawa, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 19, 1973, Ser. No. 408,017
Claims priority, application Japan, Oct. 21, 1972, 47-105693
Int. Cl. B60c *5/08*
U.S. Cl. 152—340 **8 Claims**



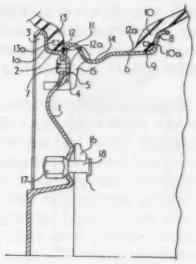
1. A pneumatic safety tire comprising an outer tubeless tire having a tread and a pair of sidewalls extending from opposing edges of the tread to corresponding tire beads; an inner tire disposed within the outer tire and having a tire tube disposed therein, said inner and outer tires defining first and second tire chambers isolated from each other, respectively, said inner tire having a pair of annular beads, a carcass including at least one reinforcing cord layer and extending across the pair of beads while turning around the opposing edges of the carcass about the beads so as to secure the carcass to the beads, a breaker disposed on the outer surface of the carcass at a crown portion thereof, and a layer of tread rubber overlying the breaker, said breaker including at least two reinforcing plies made of cords each having a Young's modulus of not smaller than 1.0×10^5 Kg/cm², said cords of the breaker reinforcing plies being disposed at an angle of 10° to 30° relative to the equatorial direction of the inner tire, said breaker of the inner tire being of cylindrical shape about the axis of rotation of the safety tire, the width of said breaker in parallel to the axis of rotation of the tire being substantially as wide as the tread of said outer tire; and a tire valve means selectively communicating said first and second tire chambers to the outside of the safety tire.

3,885,615
PNEUMATIC TIRE WHEEL RIM ASSEMBLY

William Eric Mitchell, Coventry, England, assignor to Dunlop Limited, London, England

Filed June 7, 1972, Ser. No. 260,463
Claims priority, application United Kingdom, June 16, 1971, 28096/71
Int. Cl. B60b *23/10, 25/22;* **B60c** *5/12*
U.S. Cl. 152—411 **12 Claims**

1. A rim for a pneumatic tire comprising a first rim part having a tire bead retaining flange and bead seating portion, a second rim part having the other tire bead retaining flange and a bead seating portion of the same diameter as the first bead seating portion, said second rim part being formed in the region adjacent the first rim part with a circumferentially-extending radially outwardly projecting hump portion, said hump portion including a radially inwardly turned flange constituting an attachment flange by which the second rim part is secured to the first rim part, the hump portion project-

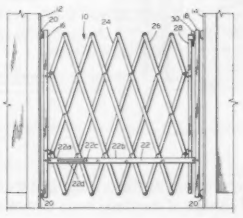


ing radially outwardly beyond the radial height of the bead seat on the second rim part and being arranged to be capable of making air-tight sealing engagement with the bead of an associated tire seated on the first rim part, the second rim part having a shallow well portion of sufficient depth to enable a tire bead to be passed over the hump portion.

3,885,616
CHILD'S GATE

Norton J. Berkowitz, Cider Mill Rd., Tolland, Conn. 06084

Filed Mar. 27, 1973, Ser. No. 345,260
Int. Cl. E06b *9/06*
U.S. Cl. 160—215 **4 Claims**



1. A gate assembly for positioning in a passageway having a pair of opposed side wall members, the gating including:

a first vertical member having first upper and lower wall engaging members thereon for engaging a first wall of a passageway, said first upper and lower wall engaging members being fixed directly to said first strut;

a second vertical strut member having second upper and lower wall engaging members thereon for engaging a second wall of a passageway, said second upper and lower wall engaging members being fixed directly to said second strut;

said first and second strut members being parallel to each other and all of said wall engaging members being identical;

movable gate means, said gate means being connected at one end to one of said vertical strut members and having a third vertical strut member at the other end thereof, said gate means being movable between a first closed position spanning the passageway between the walls and a second open position wherein at least part of the passageway is open;

engagement means for selectively connecting and disconnecting said second and third vertical strut members

when said gate means is in the closed and open positions, respectively; and

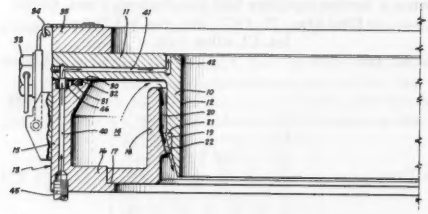
pressure bar means perpendicular to and extending between said first and second vertical strut members for urging said strut members into engagement with the walls of the passageway, said pressure bar means having two elements relatively slideable with respect to each other, one of said elements having an elongated slot, and said elements being secured in place solely by locking means connected between the other of said elements and said elongated slot;

said pressure bar means being located above the bottom of said gate means at a position not more than one third of the height of said gate means and between said first and second fixed upper and lower wall engaging members on said wall engaging struts, said pressure bar in said position providing the bearing pressure to force said first and second upper and lower wall engaging members into bearing engagement with the walls while permitting easy passage thereover by an adult in the open position of said gate means.

3,885,617
DC CASTING MOLD ASSEMBLY

John J. Foye, Livermore, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 262,510, June 14, 1972, abandoned. This application June 1, 1973, Ser. No. 365,835
Int. Cl. B22d *11/12*
U.S. Cl. 164—283 **13 Claims**



1. A DC mold assembly for casting light metals which allows for the rapid change of the mold body comprising in combination

a. an open-ended tubular mold body provided with a flange extending out radially from the feed end of the mold body and provided with at least one recess in the outer surface of the mold body;

b. a coolant jacket comprising a first extending leg generally concentric with the mold body, a second extending leg generally perpendicular to the first extending leg and a baffle member disposed between the first extending leg and the mold body, the mating surfaces of the first extending leg and the mold flange being adapted to receive a coolant-sealing gasket;

c. at least one spacing member extending inwardly from the baffle member and seated in the recess provided in the outer surface of the mold body to thereby positively position radially and axially the mold body with respect to the baffle member and define a plurality of conduits which allow the passage of coolant from the conduit defined by the baffle member and the mold body to the surface of an emerging ingot during casting;

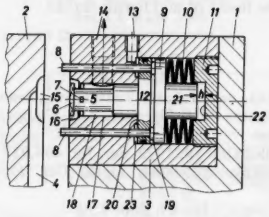
d. a resilient, rubber-like gasket provided between the mating surfaces of the first extending leg of the coolant jacket and the mold flange; and

e. means to urge the mold flange into a water-tight engagement with the first extending leg of the coolant jacket.

3,885,618
VENTILATION VALVE FOR CLOSING A VENTILATION DUCT IN A CASTING MOLD

Fritz Hodler, 28, Ave. de Collonge, Territet, Switzerland

Filed June 25, 1973, Ser. No. 373,128
Claims priority, application Switzerland, Oct. 5, 1972, 14572/72
Int. Cl. B22d *17/20*
U.S. Cl. 164—305 **17 Claims**

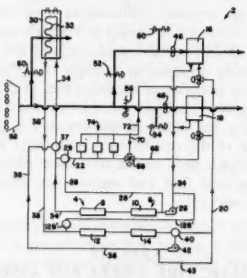


1. A ventilation valve for closing a ventilation duct in a casting mold, the valve comprising a valve cylinder; a valve piston slidingly received by the valve cylinder so as to be movable between an open and a closed position in a direction perpendicular with respect to said ventilation duct, said valve closing in the direction of the pressure exerted by casting material onto the surface of said piston which faces said ventilation duct, a displacement member which urges the piston into its open position when the mold is open; and means actuated by closure of the mold to move the displacement member away from the piston so that the piston can be brought to its closed position without being hindered by the displacement member load.

3,885,619
AIR CONDITIONING SYSTEM AND CONTROL INCLUDING METHOD AND MEANS

Alden I. McFarlan, 691 Dorian Rd., Westfield, N.J. 07090

Division of Ser. No. 80,448, Oct. 13, 1970, Pat. No. 3,774,674. This application Oct. 30, 1973, Ser. No. 411,100
Int. Cl. F25b *29/00*
U.S. Cl. 165—26 **9 Claims**



1. In a system for conditioning air for a zone in a climate where the outside air may be at a high temperature and at a low relative humidity and wherein the temperature may drop and there may be a rise in the relative humidity, the combination of, refrigeration means having liquid chiller means with a liquid flow path extending to a chilled liquid line, said refrigeration means also having a liquid heating flow path along which liquid flows to a heated liquid line to thereby remove heat from the refrigeration means, air-treating for passing air to said zone and having means connected to receive the desired

amounts of liquid from said chilled liquid line and said heated liquid line to provide air at temperature which is required for said zone, heat-exchange tower, having a liquid flow path therethrough means to exhaust air from said zone through said tower in heat exchange relationship with respect to liquid flowing along said flow path of said tower, liquid flow means to direct liquid along said flow paths, and means to pass liquid from one of said lines through said tower thereby to transfer heat between said liquid and said exhaust air.

3,885,620

HEAT-EXCHANGE INSTALLATION FOR COOLING OF A HEAT-EXCHANGE LIQUID

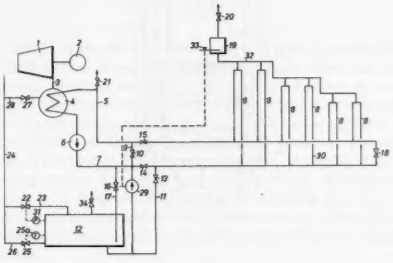
Hans-Henning Von Cleve, Bochum, Germany, assignor to Gea Luftkuhlergesellschaft Happel GmbH & Co. KG, Bochum, Germany

Filed Mar. 6, 1974, Ser. No. 448,520

Claims priority, application Germany, Nov. 13, 1973, 2356505

Int. Cl. G01d *23/00*

U.S. Cl. 161—32 **12 Claims**



1. In a heat-exchange installation for cooling of a heat-exchange liquid which is heated in a user, a combination comprising a plurality of heat-exchange elements through which heat-exchange liquid can circulate to be cooled therein; a reservoir adapted to contain said heat-exchange liquid when any of said heat-exchange elements are not in use; conduit means connecting said heat-exchange elements with a user to supply and receive heat-exchange liquid therefrom, and also with said reservoir; a source of gaseous pressure fluid; and connecting means for connecting said reservoir with said source so as to admit pressure fluid from the latter into said reservoir and expel heat-exchange liquid contained therein via said conduit means into said heat-exchange elements, to thereby provide for rapid charging of the heat-exchange elements with the heat-exchange liquid.

3,885,621

VENT CONDENSER FOR A FEEDWATER HEATER

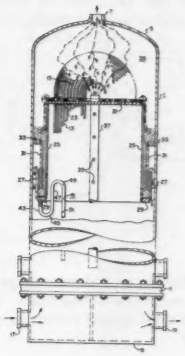
Robert G. Slebodnick, Collingdale, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 29, 1974, Ser. No. 456,423

Int. Cl. F28g *1/00*

U.S. Cl. 165—110 **9 Claims**

1. A feedwater heater comprising a vertically disposed shell portion, a plurality of U-shaped tubes forming a tube bundle disposed in said shell, a tube sheet having a plurality of holes for receiving the ends of the tubes, a tube support plate disposed transverse to said tubes adjacent the bent portions thereof, said plate having a plurality of holes through which the tubes pass in a tightly embracing relationship, a sleeve portion disposed adjacent the outer periphery of said plate, said sleeve being disposed to extend downwardly from said plate, a collar extending upwardly from the lower end of said sleeve, sealing means disposed between said collar and said sleeve, a skirt disposed between said sleeve and said collar, said skirt being fixed relative to said shell, and the upper end of said skirt being disposed in a sealing relationship with said shell, said sleeve, collar and skirt being cooperatively associated to form a water seal when said heater is operating, said



water seal cooperating with said plate to form a chamber in the upper portion of the shell and a vent nozzle disposed in the upper portion of said shell, whereby said chamber forms a vent condenser incorporating the bent portion of the U-shaped tubes.

3,885,622

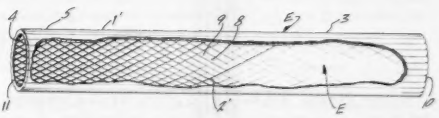
HEAT EXCHANGER TUBE

Charles D. McLain, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 214,034, Dec. 30, 1971, abandoned. This application Mar. 4, 1974, Ser. No. 447,735

Int. Cl. F28f *1/40*

U.S. Cl. 165—179 **6 Claims**



1. A welded hollow metal heat exchanger tube formed from metal strip material and having a longitudinally extending weld seam, said tube having a given wall thickness and an inside surface corresponding to one side of said strip material and an outside surface corresponding to the opposing side of said strip material, a heat exchange enhancement pattern extending throughout only a portion of the tube wall thickness embossed into at least the inside surface by embossing the corresponding side of said strip, whereby variation in enhancement pattern is provided by varying the embossment of the strip.

3,885,623

UNDERWATER WELLHEAD FOUNDATION ASSEMBLY

Bruce J. Watkins, West Covina, and Glenn D. Johnson, Downey, both of Calif., assignors to Shell Oil Company, Houston, Tex.

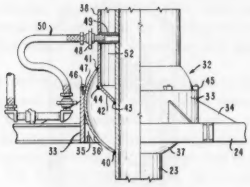
Filed May 14, 1962, Ser. No. 194,367

Int. Cl. E21b *7/12*

U.S. Cl. 166—.5 **16 Claims**

12. Landing base apparatus for use with a conductor pipe in off-shore drilling operations conducted in an underwater formation from a floating vessel, comprising in combination: a base member adapted to land on said formation, said base

member including means for supporting said conductor in said formation and means associated with said conductor pipe so arranged and proportioned that said conductor pipe is univer-



sally movable relative to said base member whereby said conductor pipe maintains substantially vertical alignment irrespective of the slope of said formation on which said base member is landed.

3,885,624

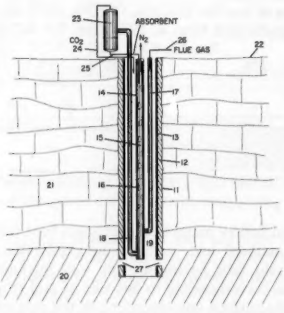
PROCESS FOR CARBON DIOXIDE MANUFACTURE

Larry P. Brown, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Division of Ser. No. 116,356, Feb. 18, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 435,147

Int. Cl. E21b *43/00*

U.S. Cl. 166—57 **2 Claims**



1. Apparatus for the manufacture of carbon dioxide comprising:

a. a well drilled into the earth,

b. a first tubing string hung within the well,

c. a flue gas generating means located at the surface for producing carbon dioxide by burning a carbonaceous material,

d. a second tubing string leading from said generating means into the lower portion of said first string,

e. vaporizer means for separating carbon dioxide from an absorbent therefor, said vaporizer having a carbon dioxide removal line leading therefrom and an absorbent removal line leading therefrom into said first string, and

f. a third tubing string which leads from the lower portion of said first tubing string into said vaporizer.

3,885,625

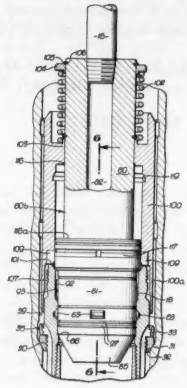
WELL CASING RUNNING, CEMENTING AND FLUSHING APPARATUS

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Feb. 7, 1974, Ser. No. 440,339

Int. Cl. E21b *43/10*

U.S. Cl. 166—181 **24 Claims**



1. Hanger apparatus for supporting a tubular string extending into a well bore from a surrounding wellhead having a seat: comprising a hanger body adapted to be moved into engagement with the seat and having a seal portion spaced laterally inwardly from the wellhead to form a seal region therewith, said body having means at its lower portion for connection to the tubular string; a running tool connectible to a running string; means releasably connecting the hanger body to the running tool to enable the hanger body to be lowered to the wellhead seat; and flushing means carried by the running tool and operatively associated with said hanger body to direct a flushing fluid from the interior of said running tool to the exterior of said hanger body at said seal portion and seal region to flush such seal portion and region.

3,885,626

OIL RECOVERY PROCESS UTILIZING HIGHER ALKYL TOLUENE SULFONATE

Walter W. Gale, Houston; Thomas L. Ashcraft, Jr., and Rhoderick K. Saunders, both of Baytown, all of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jan. 2, 1974, Ser. No. 430,338

Int. Cl. E21b *43/22*

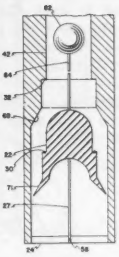
U.S. Cl. 166—273 **19 Claims**

1. In a method of recovering crude oil from a subterranean formation wherein an aqueous surfactant system is injected into the formation through at least one injection means to displace crude oil in the formation toward at least one production means, the improvement wherein the surfactant of said aqueous surfactant system is a C_{12-20} alkyl toluene sulfonate.

3,885,627
WELLBORE SAFETY VALVE

Holland J. Berry, and David W. Lewis, Richardson, both of Tex., assignors to Sun Oil Company, Philadelphia, Pa.

Division of Ser. No. 128,290, March 26, 1971, Pat. No. 3,739,845. This application June 1, 1973, Ser. No. 365,892
Int. Cl. E21b *43/12*
U.S. Cl. 166—224 A 3 Claims

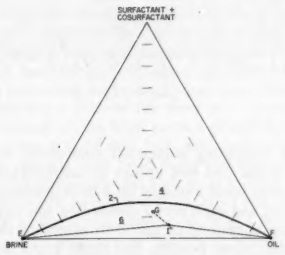


1. Safety apparatus for closing of well pipe extending from the earth surface down into earth formations where the safety apparatus operates to close in the well in response to abnormal well conditions comprising: a plug member positioned in the well pipe and located below the earth surface a valve seat spaced from and located near the plug member; means for retaining the plug in a position spaced from the valve seat, said retaining means having a two part retaining member held together by a shear pin, and means for releasing the plug from the retaining means said releasing means being a velocity float mechanically connected to the retaining member and related shear pin.

3,885,628
RECOVERY OF OIL USING MICROEMULSIONS

Ronald L. Reed; Robert N. Healy; Donald G. Stenmark, and Walter W. Gale, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jan. 2, 1974, Ser. No. 430,362
Int. Cl. E21b *43/22*
U.S. Cl. 166—252 59 Claims

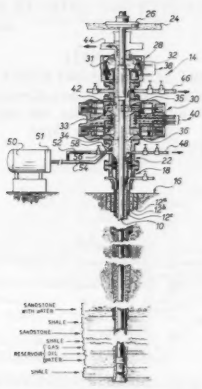


1. A method of recovering crude oil from a subterranean formation having one or more injection means in fluid communication with one or more production means which comprises injecting into said formation through said injection means a first liquid slug, then injecting into said formation through said injection means a second liquid slug, said slugs being mutually immiscible and at least one of said slugs being a microemulsion, to displace crude oil in said formation toward said production means; driving said slugs through said formation by injection of a driving fluid; and recovering crude oil through said production means.

3,885,629
METHOD AND ASSEMBLY FOR CONTROLLING BLOW-OUTS IN OIL WELLS

Brian Richard Erb, 4469 Melrose St., Montreal 261, Quebec, Canada

Filed July 27, 1972, Ser. No. 275,462
Claims priority, application Canada, Aug. 5, 1971, 119937
Int. Cl. E21b *43/24*
U.S. Cl. 166—302 1 Claim

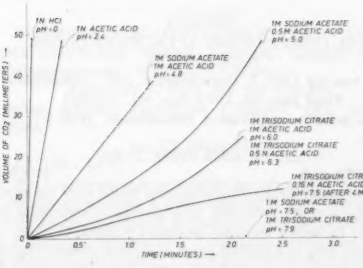


1. A method of sealing off an exploitory well for the production of oil and gas, said well having a well-head including a core through which extends a drill pipe, comprising the steps of introducing by pumping down the drill pipe liquid carbon dioxide at a given rate of flow to a desired height in said drill pipe; pumping in said drill pipe above said carbon dioxide an alcohol substance; and pumping in said drill pipe over said alcohol substance mud to thereby prevent the egress of oil and gas resulting from the blowout and to prevent ground fracturing adjacent the well.

3,885,630
BUFFER-REGULATED CARBONATE ACIDIZATION

Edwin A. Richardson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 24, 1974, Ser. No. 436,289
Int. Cl. E21b *43/27*
U.S. Cl. 166—307 8 Claims


1N HCl pH=0
1N ACETIC ACID pH=2.4
1M SODIUM ACETATE 1M ACETIC ACID pH=4.8
1M SODIUM ACETATE 0.5M ACETIC ACID pH=5.0
1M TRISODIUM CITRATE 1M ACETIC ACID pH=6.0
1M TRISODIUM CITRATE 0.5 N ACETIC ACID pH=6.3
1M TRISODIUM CITRATE 0.15 M ACETIC ACID pH=7.5 (AFTER 4 MINUTES)
1M SODIUM ACETATE pH=7.5, OR 1M TRISODIUM CITRATE pH=7.9
VOLUME OF CO2 (MILLIMETERS)
TIME (MINUTES)

8. A process for acidizing a remotely-located fluid-contactable acid-reactive material which process comprises: flowing fluid into contact with the material to be acidized; and

including in that fluid an aqueous solution which, at the time it is flowed into the remote location, consists essentially of a solution of enough water-soluble weak acid to acidize a significant amount of the acid-reactive material and enough water-soluble weak acid salt to provide a ratio of weak acid to weak acid salt that maintains the pH of the solution at a relatively high level and maintains the concentration of ionized weak acid at a relatively low level such that the rate of acidization of the acid-reactive material is relatively low.

3,885,631

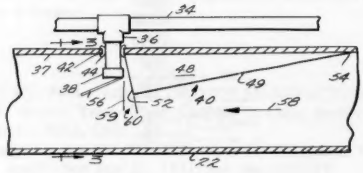
FIRE SUPPRESSING SYSTEM

Kenneth L. McBride, Box 855 Taylors, Greenville, S.C. 29687

Filed Apr. 19, 1974, Ser. No. 462,547

Int. Cl. A62c *35/36*

U.S. Cl. 169—11 **8 Claims**



1. In a material conveying system of the pneumatic type having hollow duct means for conveying material by means of a fluid current therethrough,

fire suppressing means including a plurality of dispensing means for a fire suppressing gas each disposed at spaced-apart locations within said duct means,

a plurality of baffle means for deflecting material being conveyed through said duct means around a said gas dispensing means, each of said baffle means including a base portion, a said baffle means being securely mounted on the interior of said duct means with said base portion disposed immediately upstream of a said gas dispensing means, each of said baffle means having surfaces extending from said base portion in an upstream direction with said surfaces converging substantially at a point.

3,885,632

SOIL COMPRESSING ATTACHMENTS FOR IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

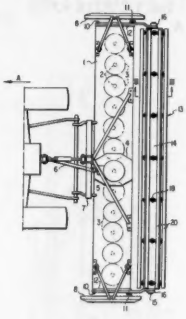
Filed June 26, 1973, Ser. No. 373,881

Claims priority, application Netherlands, June 27, 1972, 7208816

Int. Cl. A01b *49/00, 21/06*

U.S. Cl. 172—68 **17 Claims**

1. A soil compressing attachment for travel over the ground comprising a roller rotatably mounted on a horizontal axis, said roller including movably mounted peripheral parts, said parts comprising two spaced apart elongated ground engaging elements mounted on rockable arms, said arms extending substantially parallel to a plane which extends perpendicular to the axis of rotation of said roller, said arms having ends and at least one pivot pin between said ends connected to support means on said roller, said elongated elements extending substantially parallel to one another and said elements being connected to said arms on opposite sides of said pivot pin, said arms and said elements being rockable about an axis defined



by said pivot pin and said axis extending in a direction substantially parallel to the axis of rotation of said roller.

3,885,633

SOIL CULTIVATING IMPLEMENTS OR HARROWS

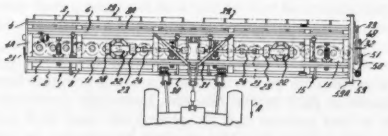
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland; Ary van der Lely, 10, Weverskade, Maasland, and Cornelis Johannes Gerardus Bom, 36, Esdoornlaan, Rozenburg, both of Netherlands

Filed June 14, 1973, Ser. No. 369,907

Claims priority, application Netherlands, Apr. 18, 1973, 7305416

Int. Cl. A01b *33/06*

U.S. Cl. 172—68 **28 Claims**

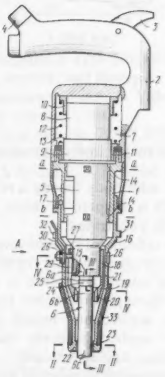


1. A soil cultivating implement comprising an elongated supporting frame and two groups of soil-working members, each said group being mounted on a corresponding transverse frame portion and each group comprising soil-working members rotatably supported on upwardly extending shafts by said corresponding frame portion, said shafts being arranged in a row and driving means being in driving engagement with the soil-working members of each group, coupling means at the forward side of said elongated supporting frame, said coupling means being connectable to the rear of a prime mover, said supporting frame extending across the transverse width of the implement to bridge said transverse frame portions, said transverse frame portions each being pivotably connected to the supporting frame through parallelogram linkage means, said linkage means making each group independently pivotable with respect to the other group and movable in substantially vertical directions on its corresponding transverse frame portion.

3,885,634
PNEUMATIC HAMMER

Albert Adolfovich Goppen, ulitsa Narodnogo opolchenia, 22, korpus 3, kv. 95; Igor Vladimirovich Nikolaev, ulitsa Fadeeva, 5, kv. 37, both of Moscow; Iosif Fadeevich Vysotsky, Vladimirovsky pereulok, 5, kv. 44; Mikhail Maximovich Zaslavsky, Vladimirovsky pereulok, 4, kv. 4, both of Tomsk; Nikolai Alexandrovich Klushin, ulitsa Narodnaya 1, kv. 23; Anatoly Mikhailovich Petreev, ulitsa Sibiryakov-Gvardeitsev, 8, kv. 59, both of Novosibirsk; Lidia Mikhailovna Dronova, ulitsa Kalarash, 5, kv. 68, Ljubertsy Moskovskoi; Anatoly Ivanovich Lednikov, Korovinskoe shosse 9, korpus 2, kv. 51; Jury Alexandrovich Grishenkov, Novye Cheremushki kvartal 34a, korpus 1, kv. 73, both of Moscow, and Jury Mikhailovich Bashlykov, ulitsa Kartasheva, 31B, kv. 18, Tomsk, all of U.S.S.R.

Filed May 23, 1974, Ser. No. 472,858
Int. Cl. B25d *9/00*
U.S. Cl. 173—104 **6 Claims**

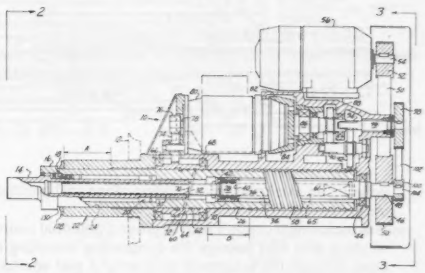


1. A pneumatic hammer comprising: a casing; a barrel in said casing, said barrel being axially movable relative to said casing; a working tool mounted in the front portion of said barrel, said working tool having a shank; an air-distribution device and an impact mechanism with a hammer piston in said barrel, said air-distribution device and impact mechanism ensuring reciprocation of said hammer piston imparting blows at the shank of said working tool under the action of compressed air; a guide bush fixed in the front portion of said barrel, the shank of said working tool being received in said guide bush; a hood mounted on the front portion of the hammer; means preventing said working tool from falling out, said means comprising a lock in the form of a tubular member rotatably mounted on the front portion of said barrel; an end wall at the front end of said lock, said end wall having an non-circular opening; said hood being rotatably mounted on said casing and embracing said lock so as to form an annular space therebetween; an end wall at the front end of said hood, said end wall having a non-circular opening; a first portion of said working tool adjacent to the shank thereof, said first portion having a shoulder, the cross-sectional shape of said shoulder corresponding to the shape of the opening of said end wall of said lock, whereby, upon a relative angular rotation of said hood and lock, after said shoulder has been received in the opening of said lock, said working tool is held in said lock from falling out; a second portion of said working tool having a non-circular cross-sectional shape corresponding to the shape of the opening of said end wall of said hood so as to ensure an angular rotation of said working tool when in the operative position by rotating said hood; means for locking said working tool in the hammer, said means providing the fixing of the relative angular position of said hood and lock in the operative position at which the openings of said end walls of said hood and lock are not in register, whereby said working tool is positively held in said lock.

3,885,635
TWO-SPEED MECHANICAL QUILL FEED AND SPINDLE DRIVE MECHANISM FOR A MACHINE TOOL

Klaus Menzel, Orchard Lake, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 19, 1974, Ser. No. 462,286
Int. Cl.[2] B23Q *5/40;* **E21C** *5/02*
U.S. Cl. 173—146 **12 Claims**



1. A two-speed quill drive comprising:
a quill shaft mounted for sliding movement along its longitudinal axis;
a spindle shaft rotatably mounted for rotation with respect to said quill shaft, adapted to be carried therewith during said longitudinal movement of said quill shaft;
a first motor;
a second motor having an armature and an armature shaft connected to said armature;
means for producing longitudinal advancing movement of said quill shaft, said means including drive means drivingly connecting said second motor armature shaft and said quill shaft so as to cause said longitudinal movement of said quill shaft in response to rotation of said armature shaft;
means drivingly connecting said first motor and said spindle shaft so that said spindle shaft is rotated by said first motor; and
means drivingly connecting said second motor armature shaft and said first motor whenever said second motor is deenergized whereby said first motor is adapted to rotate said spindle shaft and is also adapted to longitudinally advance said quill shaft through said second motor armature shaft.

3,885,636
TERMINAL FOR LOW-TEMPERATURE CABLE

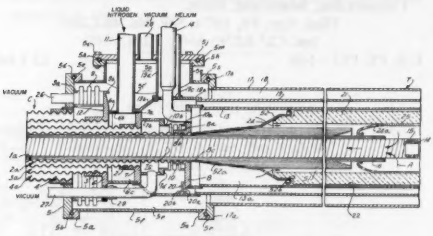
Ullrich Hildebrandt, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Oct. 9, 1973, Ser. No. 404,681
Claims priority, application Germany, Oct. 10, 1972, 2249560
Int. Cl. H01v *11/00*
U.S. Cl. 174—15 C **23 Claims**

1. A low-temperature system for the transmission of electrical energy comprising a cable having at least three coaxial corrugated ducts defining at least two annular compartments and a central compartment, a conductor extending through said central compartment, and a layer of electrical insulation disposed between said conductor and the wall of the innermost duct, a terminal disposed at one end of said ducts and defining a deep-cooling zone adjacent said ducts, a cool zone adjacent said deep-cooling zone and a warm zone adjacent said cool zone, the improvement wherein said terminal comprises:

respective conductor means electrically connected to said conductor and extending through said zones for transmission of electric current in series through the respective conductor means, said conductor means of said cool zone including an electrically conductive tube;

A sheath of electrical insulating material surrounding said conductor means at least in said deep-cooling zone and



defining an axial passage extending along said conductor means in said deep-cooling zone; and

means including a conduit held at ground potential communicating with said passage for conducting a cooling medium through the innermost duct around said conductor means through said deep-cooling zone and then through said electrically conductive tube.

3,885,637

BORING TOOLS AND METHOD OF MANUFACTURING THE SAME

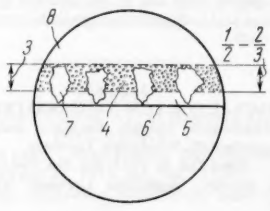
Vladimir Ivanovich Veprintsev, Chongarsky bulvar, 11, korpus 1, kv. 30; Lev Iosifovich Klyachko, B. Cheremushkinskaya ulitsa 2, kv. 234; Nikolai Andreevich Kudrya, Simferopolsky proezd 9, kv. 58; Evgeny Ivanovich Suslov, Krivorozhskaya ulitsa, 31, kv. 36; Gennady Petrovich Grishin, ulitsa Narodnogo opolchenia, 20, kv. 174; Anatoly Vasilievich Kolchin, Krivorozhskaya ulitsa, 31, kv. 61; Evgeny Vasilievich Funtikov, B. Cheremushkinskaya ulitsa, 2, korpus 1, kv. 127; Vladimir Fedorovich Shpak, 3 ulitsa Textilschikov, 20, kv. 8, and Vasily Andreevich Barkov, Varshavskoe shosse, 10, kv. 79, all of Moscow, U.S.S.R.

Filed Jan. 4, 1974, Ser. No. 430,940

Claims priority, application U.S.S.R., Jan. 3, 1973, 1862188

Int. Cl. E21b *9/36*

U.S. Cl. 175—329 **4 Claims**



1. A boring tool comprising: a body; a rock-destroying member secured to the body; a matrix of said rock-destroying member; a first metallic layer in said matrix arranged over a rock-destroying surface of the rock-destroying member; a second metallic layer in the matrix containing embedded fine abrasive grains and arranged internally relative to the first metallic layer; cutting elements comprising coarse abrasive grains which are located at the boundary of said two layers and penetrate at ½ – ⅔ in the matrix layer containing embedded grains, while the remaining portion of the coarse grains are located in the exclusively metallic layer of the matrix.

3,885,638

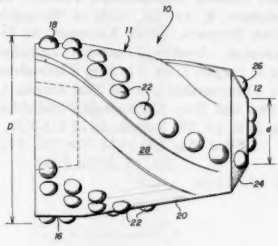
COMBINATION ROTARY AND PERCUSSION DRILL BIT

Sam C. Skidmore, 1513 Azteca Dr., Fort Worth, Tex. 76112

Filed Oct. 10, 1973, Ser. No. 405,115

Int. Cl. E21c *13/06*

U.S. Cl. 175—390 **10 Claims**



1. A combination rotary and percussion drill bit, comprising:

a. a substantially solid body having a relatively narrow and flat point which is adapted to make initial contact with the matter to be penetrated;

b. a substantially cylindrical base having one or more hardened inserts protruding radially therefrom, said base and its inserts being adapted to serve as a gauging member, and said base having both means against which torque forces may be applied and means against which axial forces may be applied, whereby the bit may be both rotated and driven axially forward;

c. a generally frustoconical sidewall section extending between the narrow point of the body and the larger cylindrical base thereof;

d. a plurality of hardened inserts mounted on the bit and protruding outwardly from the frustoconical surface thereof, said inserts being arranged substantially symmetrically in helical rows extending from the point to the base, and each row winding at least 120° around the bit as it traverses the distance from the point to the cylindrical base, and the protruding inserts in a given row being closely spaced to effectively establish an elevated ridge which is adapted to urge cuttings around and past the bit during rotary movement thereof, and the spacing between adjacent inserts being less than the width of said inserts; and

e. hardened means on the point for fracturing such brittle material as may be encountered during drilling.

3,885,639

MULTIPROPORTION BEAM SCALES FOR MEASURING EQUAL VOLUMES OF MATERIALS HAVING DIFFERENT SPECIFIC GRAVITIES

Robert B. McLarrin, 2495 Hillside Dr., Eureka, Calif. 95501

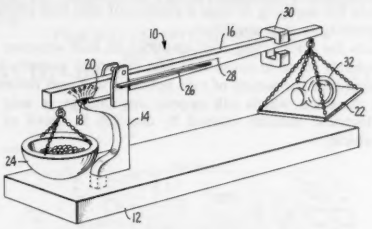
Filed Nov. 7, 1974, Ser. No. 521,669

Int. Cl. G01g *23/14, 1/18*

U.S. Cl. 117—172 **9 Claims**

1. A beam scales for directly measuring a volume for material which is equal to the volume of an object having a specific gravity different from that of the material, said scales comprising: a balance beam; first support means at one end of the beam for supporting the object; second support means at the other end of the beam for supporting the volume of material to be measured; a fulcrum support disposed intermediate the

ends of the beam and so positioned relative to the first and second support means that the beam balances when the volume of material supported on the support means equals the volume of an object supported on the first support means.



3,885,640

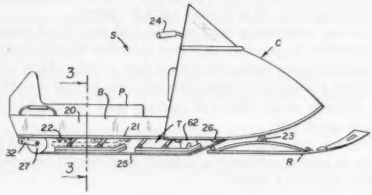
SLIDE ASSEMBLY FOR SNOWMOBILES

Louis A. Valentine, Aurora, and Henry L. Valentine, Boulder, both of Colo., assignors to Louis A. Valentine and Henry L. Valentine, both of Aurora, Colo.

Continuation-in-part of Ser. No. 7,540, Feb. 2, 1970, Pat. No. 3,637,265. This application Dec. 11, 1970, Ser. No. 97,172

Int. Cl. B62m *27/02;* **B62d** *55/10*

U.S. Cl. 180—5 R **10 Claims**



1. In combination with a snowmobile having a drive track mounted between forward drive wheels and rearward idler wheels, a slide track assembly adapted to engage the lower reach of the track between the drive and idler wheels to support the snowmobile thereon, and comprising:

a. a frame including a pair of longitudinally disposed members carried on the snowmobile, one at each side of the track, and transversely disposed pivot bars between the longitudinal members;

b. a plurality of longitudinally disposed slides below the frame and upon the lower reach of the track with one slide being at each side of the track;

c. inclined rocker arms at each side of the frame with one end of each arm pivotally connecting with a pivot bar and the other end of each arm pivotally connecting with a slide to permit the slide to move upwardly toward and downwardly away from the frame;

d. means associated with each rocker arm to bias the arms and slides thereon downwardly and away from the frame and thus support the snowmobile above the track and to permit vertical movements of the slides as when the snowmobile is moving over rough terrain;

e. the rocker arm connections with the pivot bars including a pivot sleeve fixedly attached to each rocker arm and carried upon its pivot bar, the pivot sleeves at one side of the frame being independent of the pivot sleeves at the other side of the frame, whereby the rocker arms and the slide at one side of the frame is permitted to move independently of the rocker arm and the slide at the other side of the frame so as to permit the snowmobile to tilt sideways;

f. clutch means interconnecting the pivot sleeves on a pivot bar whereby pivotal movement of the rocker arm at one side thereof will act against the rocker arm at the other side thereof, wherein the clutch means includes:

means to permit a predetermined degree of movement of the rocker arm and slide at one side of the frame with respect to the other side and to interlock the rocker arm and slides of both sides when the movement of one exceeds the said predetermined degree of movement.

3,885,641

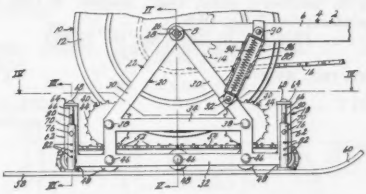
SKI ATTACHMENT FOR MOTORCYCLES

Walter L. Harris, 8804 W. 104th Ter., Overland Park, Kans. 66212

Filed Dec. 10, 1973, Ser. No. 423,145

Int. Cl. B62m *27/02*

U.S. Cl. 180—5 R **7 Claims**



1. For use in combination with a motorcycle having a main frame and a power driven rear ground-engaging wheel, a ski attachment comprising:

a. an attachment frame including means for mounting it on said main cycle frame,

b. an endless traction belt carried operably by said attachment frame so as to be disposed beneath said rear cycle wheel, and having a normally horizontal lower reach,

c. a ski having an aperture formed therethrough,

d. attaching means connecting said ski to said attachment frame so that said belt is disposed within the aperture of said ski and its lower reach engages a snow surface beneath said ski,

e. at least one drive roller carried rotatably by said attachment frame, said drive roller including a friction portion engageable with said cycle wheel whereby said roller is turned by rotation of said wheel, and a sprocket wheel rotatable with said friction portion, and

f. a flexible sprocket chain affixed peripherally to said traction belt and meshed with said sprocket wheel.

3,885,642

FINAL DRIVE MOUNTING FOR A TRACK-TYPE VEHICLE

Calvin L. Miller, Aurora, and Harvey A. Knell, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 20, 1974, Ser. No. 471,207

Int. Cl. B62d *55/08*

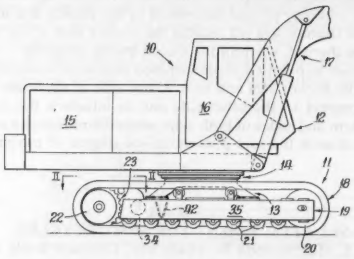
U.S. Cl. 180—9.2 R **8 Claims**

1. A track-type vehicle disposed for movement along a longitudinal axis thereof comprising

a track roller frame having a pair of laterally spaced outer and inner rails,

a final drive having a housing, and

mounting means securing said housing to said frame comprising first connection means securing said housing to an



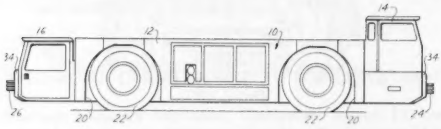
inner side of said outer rail and second connection means securing said housing to a rearward end of said inner rail.

3,885,643

ELEVATABLE CAB FOR VEHICLES

Edgar R. Goodbary, Tulsa, Okla., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Filed July 31, 1970, Ser. No. 59,903
Int. Cl. B62d *33/06*
U.S. Cl. 180—89 R **1 Claim**



1. In combination with a steerable vehicle having a substantially horizontal platform secured thereto, a cab section movably secured to the vehicle and disposed above the platform, the cab section comprising an outer housing having a substantially vertical backwall secured thereto and operator controls and control lines disposed therein, horizontal shoulder means provided on the upper portion of the vertical backwall, elongated power fluid piston means having one end thereof pivotally secured to the shoulder means and the opposite end being pivotally secured to the platform for transmitting reciprocal vertical movement to the cab section, vertically disposed track and roller means cooperating between the backwall of the cab section and the vehicle for guiding the vertical movement of the cab section and for providing cantilever support to the cab section when said cab section is raised above the platform, and including an elongated channel means pivotally secured at one end thereof to the lower portion of the cab section, the opposite end of said channel means being slidably disposed against the platform for the protection of the operator control lines extending from the cab section to the vehicle during the raising and lowering of the cab section.

3,885,644

VARIABLE GAIN VEHICLE SPEED CONTROL SYSTEM

Helmut G. Seidler, Schwenksville, and James T. Walker, Norristown, both of Pa., assignors to Philco-Ford Corporation, Blue Bell, Pa.

Filed Dec. 10, 1973, Ser. No. 423,549
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 E **2 Claims**

1. A vehicular speed control system for use in a vehicle having a throttle controlled engine and vehicle speed sensing means, said system comprising:

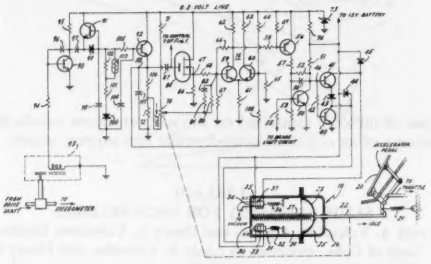
electromechanical actuator means for operating said throttle to vary the speed of said vehicle through the action of said engine,

means for generating a first electrical quantity in response to the position of said actuator and in direct proportion to the motion that will result in throttle advance,

an amplifier adapted to operate said actuator,

means for applying at least a portion of said first electrical quantity to said amplifier,

means for connecting said amplifier to said actuator in a polarity sense to cause said first electrical quantity to be varied by the action of said actuator and said throttle in a direction which will oppose any change in said first electrical quantity caused by changes in speed of said vehicle,



means for generating a second electrical quantity proportional to the speed of said vehicle, said generating means producing a voltage that varies in linear proportion to vehicle speed,

means for establishing and storing a third electrical quantity representative of a desired vehicle speed,

means for comparing said second and said third electrical quantities to produce an error quantity representative of the difference between desired and actual vehicle speeds, means for applying said error quantity to said amplifier in a polarity sense that will operate said system to reduce said error, and

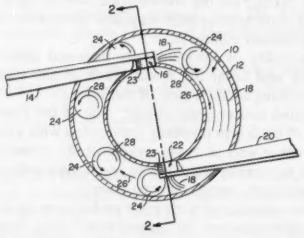
means for applying a portion of said second electrical quantity to said amplifier in a polarity such that it opposes said first electrical signal.

3,885,645

DYNAMIC MUFFLER

Roy M. Harrigan, Bromley Mountain Rd., Manchester, Vt. 05254

Filed Apr. 10, 1974, Ser. No. 459,775
Int. Cl. F01n *1/08*
U.S. Cl. 181—49 **12 Claims**



1. A muffler comprising:

A. a chamber in the form of a closed loop path having a given cross-sectional area,

B. an inlet to said chamber for exhaust gas,

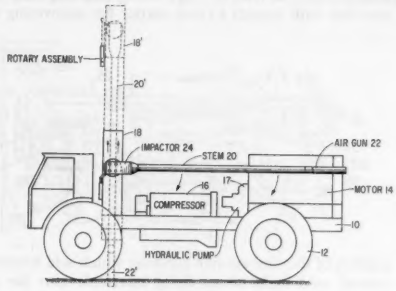
C. an outlet from said chamber for the exhaust gas, and

D. a plurality of objects rollable in said chamber around said closed loop path, said objects being dimensioned to substantially encompass the cross-sectional area of said path.

3,885,646
DRY LAND AIRGUN IMPLEMENTATION SYSTEM

Joseph W. Knight, and Kennis W. Gilbert, both of New Orleans, La., assignors to Amoco Production Company, Tulsa, Okla.

Filed July 12, 1971, Ser. No. 161,577
Int. Cl. G01v *1/04*
U.S. Cl. 181—114 **6 Claims**



5. An apparatus for initiating a seismic signal in the earth which comprises:

a vehicle;

an extensible mast having a first portion extendable and retractable in the vertical direction and a non-extendable portion which is supported by said vehicle in a fixed position relative to said vehicle;

a stem means;

pivot means connecting said stem means to said first portion of said extensible mast, said stem means not otherwise connected to said vehicle;

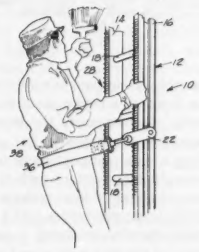
means to rotate said stem means about said pivot means in a vertical plane; and

a seismic source connected to said stem means.

3,885,647
CLIMBING SAFETY DEVICE

Anthony L. Acosta, 1645 Burrows St., San Francisco, Calif. 94134

Filed July 5, 1973, Ser. No. 376,539
Int. Cl. A62b *35/00*
U.S. Cl. 182—8 **6 Claims**



1. A climbing safety device for use with an upwardly extending member for preventing the fall of the user thereof as said user ascends or descends along the upwardly extending member comprising:

means interconnecting the user and the upwardly extending member and comprising a bar member connected at one end to the user and pivotally connected at the other end to the upwardly extending member and movable therealong as the user ascends and descends along the upwardly extending member;

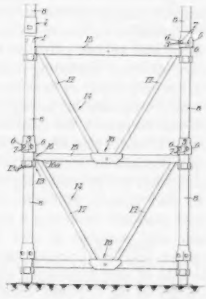
the upwardly extending member defining a plurality of depressions along its length;

engaging means fixed to the bar member intermediate its ends and seatable in any one of said depressions to engage the surface defining said depression upon predetermined downward movement of the user which pivots the bar member downwardly relative to the upwardly extending member to limit downward movement of the bar member, and user relative to the upwardly extending member; the bar member normally being disposed in an attitude relative to the upwardly extending member to allow relatively free movement of the user and the bar member therewith upwardly and downwardly along the upwardly extending member with the engaging means being removed from and free of said depressions.

3,885,648
BAYONET - TYPE CONNECTION

Bernard Beziat, Carrieres sur Seine, France, assignor to Societe Nouvelle des Echafaudages Tubulaires Mills, Le Bourget, France

Filed Jan. 8, 1974, Ser. No. 431,744
Claims priority, application France, Jan. 31, 1973, 73.03425
Int. Cl. E04g *1/06*
U.S. Cl. 182—178 **7 Claims**

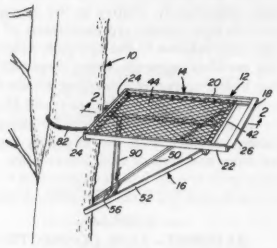


1. In a bayonet-type connection comprising a male element formed by a cylindrical tubular section having at least one radial catch, and a female element adapted to receive such male element and produce an axial locking effect once the male element has been suitably encased in the female element and a relative rotary movement has taken place between the male and female elements the improvement that the female element is formed by a tubular section having at least one deformed zone extending axially from one of the ends of such section to a central region, and at least one perforate zone disposed between the central region and such end, the perforate zone being offset in relation to the deformed zone, the deformed zone radially outwardly enlarging the tubular section to allow the passage of the radial catch of the male element, and the perforate zone having an opening such that the radial catch takes up position therein when the relative rotary movement has taken place between the male and female elements.

3,885,649
HUNTER'S TREE STAND

John R. Damron, 1013 Guion St., Ottawa, Ill. 61350

Filed June 18, 1974, Ser. No. 480,498
Int. Cl. A47c 9/10
U.S. Cl. 182—187 8 Claims



1. A hunter's tree stand including a generally horizontal support platform including opposite inner and outer ends, an elongated brace structure pivotally supported at one end from the outer end portion of said platform for swinging relative to the latter about an axis extending transversely of said brace structure and said platform between a first collapsed position with said brace structure closely underlying and substantially paralleling said platform and the other end of said brace structure projecting outwardly of the inner end of said platform and a second operative positon with said other end of said brace structure inclined downwardly from said platform and terminating downwardly in generally vertical alignment with the inner end of said platform, means anchored to said inner end of said platform and adapted to be secured about a tree trunk against which said inner end of said platform is abutted, the other end of said brace structure including means adapted to frictionally engage a lower portion of said tree trunk below said platform, said brace structure including interconnected longitudinal opposite side members, the ends of said opposite side members adjacent the outer end of said platform including transverse pivot pin portions projecting laterally outwardly therefrom toward each other and pivotally supported from the outer end portion of said support platform, said outer end portion of said support platform including a transverse angle member, the opposite end portions of said angle member including angle member sections opening theretoward and secured to the open side of said transverse angle member a spaced distance inwardly of the opposite ends of said transverse angle member, the adjacent ends of said pivot pins being received between the confronting surfaces of said angle member sections and the opposing surfaces of the opposite end portions of said transverse angle member, and abutment flanges carried by the opposite end portions of said transverse angle member and closely opposing the remote ends of said pivot pins.

3,885,650
SPREADING DISC BRAKE WITH REMOVABLE SHOES

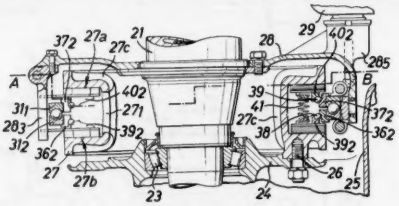
Hermann Klaue, Tour d'Ivoire 24e, 1820 Montreux, Switzerland

Continuation-in-part of Ser. No. 73,566, Sept. 18, 1970, abandoned. This application Sept. 12, 1972, Ser. No. 288,287
Claims priority, application Germany, Dec. 2, 1969, 1960286; Dec. 27, 1969, 1965171; Dec. 27, 1969, 1965170
Int. Cl. F16d 55/04
U.S. Cl. 188—71.4 21 Claims

1. A brake assembly comprising:

a brake housing comprising an annular member having an annular gap of channel-like cross-section open on its radially exterior side, the opposite inner sides of said channel-like gap providing annular braking surfaces, said brake housing being attachable to be rotatable jointly with a wheel of an assembly to be braked;

pairs of segmental brake shoes disposed from the radially exterior side into the channel-like gap having friction faces facing the adjacent braking surfaces, each of said pairs of brake shoes being attached to a member attached to a carrier adapted to be secured to a stationary part of the assembly, said members extending over the channel-like gap, and at least two oppositely disposed members movable with respect to said carrier for uncovering the



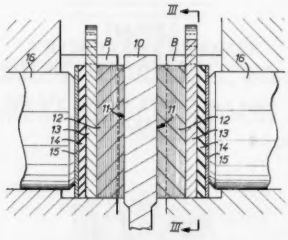
portion of the channel-like gap over which said members extend, said brake shoes being insertable into the gap from the radially exterior direction after partly uncovering said gap with the movable members without dismantling the brake assembly;

brake shoe operating means separate from the brake shoes comprising actuator rings and actuating means for spreading apart said rings which are arranged between the pairs of brake shoes including linking members for causing said shoes to contact the braking surfaces of the brake housing.

3,885,651
BRAKE ASSEMBLY

Jean Odier, Antony, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Apr. 30, 1973, Ser. No. 355,490
Int. Cl. F16d 65/00
U.S. Cl. 188—73.5 9 Claims



1. A brake assembly comprising a rotatable element having a braking surface thereon, a brake shoe, mounting means for mounting the brake shoe opposite the braking surface, said brake shoe comprising a composite flat platelike sandwich structure including a rigid support plate and a brake lining adapted to be brought into contact with the braking surface and a flat damping element of heat-resistant butyl rubberlike material with visco-elastic properties and a Young's modulus of about 10^7 N/m² thereby to damp a predetermined frequency of vibration of the brake shoe and a covering element adjacent to the damping element and having steel-like elastic properties, and resilient means operatively located between a lateral edge of the brake shoe and the mounting means, said resilient means having a stiffness of about 5×10^6 N/m thereby to channel the frequency range of audible brake shoe vibrations into a narrowed range approaching said predetermined frequency of vibration which the damping element is adapted to damp thereby reducing noise produced by the vibrations.

3,885,652

AUTOMATIC ADJUSTERS FOR VEHICLE BRAKES

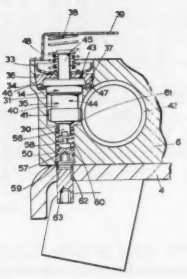
Richard Gerald Meade Taylor, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Jan. 4, 1974, Ser. No. 430,691

Claims priority, application United Kingdom, June 8, 1973, 27351/73

Int. Cl. F16d 65/56

U.S. Cl. 188—196 D 6 Claims



1. An automatic slack adjuster for a vehicle brake having a friction member, and a rotatable braking member with which said friction member is adapted to engage, said slack adjuster comprising a strut assembly having a first part, a second part, and a non-reversible screw-threaded connection between said first and second parts, rotatable adjusting means for rotating said parts relatively to each other to increase the effective length of said strut assembly to maintain at a substantially constant value braking clearance between said friction member and said braking member, a first helical gear on one of said first and second parts, a second helical gear on said adjusting means in mesh at all times with said first helical gear, and means defining between said gears a degree of back-lash of a predetermined value equal to said braking clearance and a normal brake applying movement, said adjusting means normally being located in a first datum position but rotatable into a second datum position only when movement of said strut assembly in a brake applying direction exceeds a said predetermined value to take-up said back-lash, whereafter movement of said strut assembly in an opposite direction first takes up the back-lash, and then said gears engage to cause the said one part to rotate with respect to said adjusting means which is held fast, and with respect to the other part thereby increasing the effective length of said strut assembly, wherein said adjusting means comprises a two-part relatively rotatable assembly of which one part comprises an annular plate having a central opening and an outer peripheral edge defining a clutch surface for engagement with a complementary clutch surface in said housing, and of which the other part comprises a head, and a stem carrying said head and projecting through said opening in said plate, an inner face of said plate and an outer face of said head defining clutch surfaces, and a spring acting between said plate and an end of stem projecting from said plate to urge said clutch faces into friction engagement, a re-set member for rotating said adjusting means manually being engagable with an end of said head remote from said stem whereby to rotate at least said head and said stem with respect to said housing.

3,885,653

BRAKE ADJUSTERS

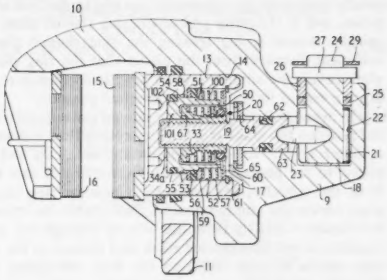
Glyn Phillip Reginald Farr, Kenilworth, England, assignor to Girling Limited, Birmingham, England

Filed Sept. 27, 1973, Ser. No. 401,198

Claims priority, application United Kingdom, Nov. 1, 1972, 50259/72

Int. Cl. F16d 65/56

U.S. Cl. 188—196 D 24 Claims



1. In a hydraulic brake actuator which has two components relatively movable apart by the application of hydraulic pressure therebetween, an automatic slack adjuster which comprises an auxiliary stepped piston having first and second external cylindrical surfaces of larger and smaller diameter respectively and having a hollow interior, first and second sealing means slidably sealing one of the actuator components to said first and second cylindrical surfaces such that the hydraulic pressure acts on said one actuator component and said auxiliary piston in opposite directions so that said auxiliary piston is urged towards the other actuator component by the hydraulic pressure, a spring biassing said auxiliary piston away from said other actuator component, an adjuster member associated with said other actuator component, and an adjuster mechanism disposed essentially in said hollow interior of said auxiliary piston and operative between said one actuator component and said adjuster member, said adjuster mechanism being automatically adjustable responsively to relative axial movement between said auxiliary piston and said other actuator component in excess of a desired movement.

3,885,654

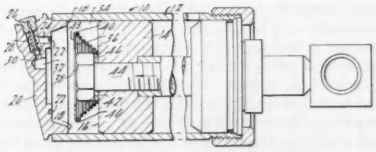
DECELERATION DEVICE AND VALVE MECHANISM

Vernon O. Hauswirth, Madison Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 5, 1974, Ser. No. 458,379

Int. Cl. F16f 9/34, 9/48

U.S. Cl. 188—284 2 Claims



1. An improved deceleration device for a hydraulic cylinder which has a piston mounted for movement in the cylinder between terminal positions, the deceleration device comprising:

an end cap of circular shape sealing off the end of the cylinder adjacent which the piston is positioned when in one of its terminal positions;

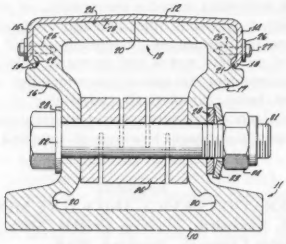
an annular groove formed on the surface of the one end cap facing into the cylinder, the groove being symetrical about the central axis of the end cap;

a hydraulic passage forming a portion of the end cap;
passage means for connecting the annular groove to the hydraulic passage;
a ring shaped plate having a dimension between an inner diameter and an outer diameter thereof greater than the width of the annular groove so that the groove is covered when said ring shaped plate is in covering relationship therewith;
at least one small opening through said ring shaped plate;
a spirally wound spring secured at one end to the face of the piston and at the other end to the ring shaped plate, the spirally wound spring spacing the ring shaped plate a sufficient distance from the piston that the ring shaped plate covers the annular groove prior to the piston reaching the end of its travel to its terminal position;
whereby when the piston is being moved towards its terminal position the annular groove conducts fluid within the cylinder in the volume between the end cap and the piston to the passage means for exhausting of that fluid from the cylinder, and whereby: when the ring shaped plate covers the annular groove, fluid within the cylinder is exhausted initially from the volume through the small opening in the ring shaped plate and thence to the passage means thereby reducing the fluid exhausting rate from the cylinder to cause a deceleration of the piston as it approaches its terminal position.

3,885,655
HIGH CONDUCTIVITY LIGHTWEIGHT THIRD RAIL FOR ELECTRIC RAILWAYS

James A. Corl, San Carlos, and Ronald J. Kilburg, Belmont, both of Calif., assignors to The Rucker Company, Oakland, Calif.

Filed Apr. 27, 1973, Ser. No. 355,050
Int. Cl. B60m *1/30*
U.S. Cl. 191—29 **10 Claims**

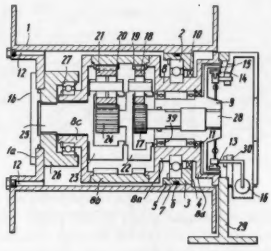


1. A composite electrical conductor comprising:
a hollow rail made of lightweight electrically conductive material such as aluminum, the rail having a base, two sides integrally formed with the base and an upper wall integrally attached to the sides, the upper wall being formed in two segments which are slightly spaced from each other when the rail is in an unstressed condition;
a U-shaped cap formed of an electricaly conductive material such as steel which wears better than aluminum, the cap being dimensioned to fit onto the upper portion of the rail and stress the rail so as to substantially close the gap between the two segments of the rail upper wall and introduce pressure between the cap and the rail to assure good electrical contact between them, the cap and the rail being sufficiently springy such that they remain under stress so as to continue good electrical contact, means forming rounded internal grooves at the junction between the sides and base of the rail which facilitate moving the walls to close the gap when the cap is snapped onto the rail; and
means maintaining the cap on the rail in addition to the spring forces of the material.

3,885,656
WINCH WITH GEARING AND BRAKE INSIDE OF A CLOSED DRUM

Wilhelm Michling, Hattingen, and Heinz Rauscher, Witten, both of Germany, assignors to Mannesmann-Meer AG, Monchen-Gladbach, Germany

Filed Jan. 28, 1974, Ser. No. 437,113
Claims priority, application Germany, Jan. 26, 1973, 2304370; Feb. 6, 1973, 7304814
Int. Cl. F16h *57/00;* **B66d** *1/30*
U.S. Cl. 192—4 R **4 Claims**



1. In a winch for ropes or cable, having a drum receiving and being connected to for being driven by at least one planetary gear, further having a brake for the drum, the drum being journalled by means of ball or roller bearings disposed to both sides (axially) of the ring gear of the planetary gear, a driving shaft journalled in a stationary part of the winch to which is also connected the said ring gear for remaining stationary therewith, the stationary part of the winch extending into the drum, circumscribing the driving shaft, the improvement comprising:
a supporting annulus having a cylindrical, sleeve-like portion bearing against but not being secured to the drum, in a cylindrical interface, there being an annular groove in said sleeve, holding a sealing ring which bears against the drum at said interface to provide sealing between the annulus and the drum;
an outer race as part of one of said bearings being mounted to the inside of said sleeve;
an inner race of said one bearing being disposed on the stationary part as extending into the drum;
the supporting annulus having an inwardly directed flange on the side of the said one bearing facing axially the exterior of the drum;
a first oil-tight, radial sealing ring between said flange and said stationary part; and
a second oil-tight, radial sealing ring between said stationary part and said shaft, said first and second sealing ring together with said annulus, said stationary part and said shaft closing one axial end of said drum.

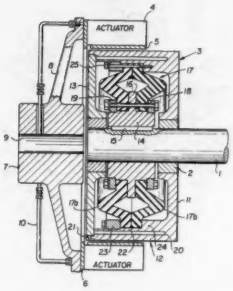
3,885,657
FRICTION CLUTCH

Hisaharu Sato, Seiei-So, No. 50-16 Tsukakoshi, Warabi, Saitama Prefecture, Japan

Filed Sept. 28, 1973, Ser. No. 401,899
Int. Cl. F16d *13/10, 3/76*
U.S. Cl. 192—79 **6 Claims**

1. In a clutch having an input member and an output member mounted for rotation relative to each other about a common axis, a drum element connected to one of said members for joint rotation and having an engagement face of circular cross section about said common axis, a plurality of friction shoes mounted on the other member in circumferentially spaced relationship, and actuating means for moving said friction shoes into motion transmitting frictional engagement with said engagement face, the improvement which comprises:

a. said drum element including a circumferential wall having two annular portions offset radially relative to said common axis,
1. one of said portions carrying said engagement face,
2. the other portion being radially spaced from said one member,
3. the two portions of said circumferential wall defining therebetween at least one cavity extending about said common axis in an arc of at least 180°; and



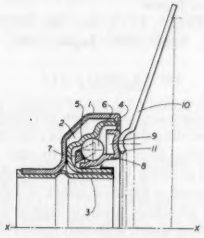
b. a ring of elastomeric material radially interposed between said other portion of said circumferential wall and said one member, respective radial portions of said ring being fixedly fastened to said one member and to said other portion of said circumferential wall for transmitting torque between said drum element and said one member, said at least one cavity impeding the transmission of the heat generated by frictional engagement of said shoes with said engagement face to said ring.

3,885,658

SYSTEM FOR MOUNTING CLUTCH RELEASE BEARINGS

Horst Ernst, Eltingshausen; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Oct. 11, 1973, Ser. No. 405,404
Claims priority, application Germany, Oct. 14, 1972, 2250455
Int. Cl. F16d *19/00, 11/06*
U.S. Cl. 192—98 **6 Claims**



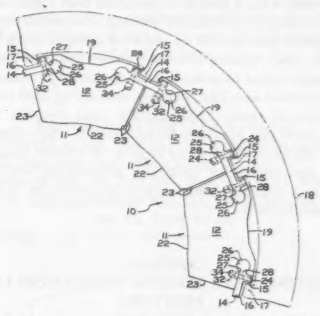
1. The combination of a clutch release bearing and a clutch release lever mechanism, comprising an annular first race member, the axial frontal end of which has a curved surface, and a clutch release mechanism having at least one lever, the end of which engages said frontal surface of said first race member said end having a surface curved in cross section to conformingly mate with the frontal surface of said first race member, the radius of the curvature of one of said curved surface being larger than the other whereby a radial force is exerted to center the bearing with respect to the lever mechanism.

3,885,659

SEGMENTAL FRICTION MEMBER FOR BRAKE OR CLUTCH

Billy N. Smith, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 24, 1973, Ser. No. 400,014
Int. Cl. F16d *13/64*
U.S. Cl. 192—107 R **5 Claims**



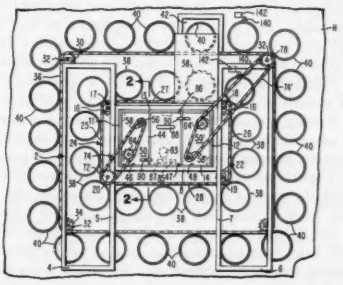
1. A segmented friction member for a brake or clutch having a series of annularly disposed friction segments forming an annular friction face, a torque link member connecting adjacent friction segments at positions near the radially outer edges, said torque link having locking portions movable into interlocked positions with said adjacent friction segments, spline driving means on said torque link engageable with an associated brake or clutch structure, said locking portions of said torque link having shaped end portions and said adjacent friction segments having shaped slots for retaining said end portions in locked relationship, said shaped end portions being movable axially of said annular friction face into said shaped slots and pin means extending through said torque link and into said adjacent friction segments to retain said torque link in said interlocked position.

3,885,660

VENDING MACHINE WITH PLURAL CONVEYORS

Howard L. Burks, Lake Park, Fla., assignor to Jack Follrath, Jensen Beach, Fla.

Filed Nov. 6, 1972, Ser. No. 304,094
Int. Cl. G07f *5/12, 11/58*
U.S. Cl. 194—9 T **24 Claims**



1. A product dispensing machine including a plurality of conveyors, each including means for delivering like or different products to a dispensing station, there being at least two

said conveyors, said two conveyors each comprising an endless conveyor, one of which endless conveyors is surrounded by the other, said two conveyors being supported on drive elements which are spaced in vertical planes, means for the independent drive of said two conveyors through said drive elements, to move a selected one of said conveyors to successively present the products carried thereby to its dispensing station, and a framework commonly supporting said conveyors and providing a receptacle for said drive means which is central to and surrounded by said two conveyors.

22. A coin meter for a vending machine of the type having a dispensing mechanism responsive to a signal from said coin meter upon the depositing therein of the proper number of correct coins, a start switch to generate said signal, said coin meter providing a coin channel leading downwardly and being so configured that the last of the total correct coins required to operate said vending machine closes said start switch to produce said signal to actuate said dispensing means, a horizontally oriented disc-like member underlying said coin channel whereby to retain coins therein, said disc-like member having at least one aperture therein which when aligned with said coin channel allows coins to drop therefrom through said aperture and means for rotatively positioning said disc-like member in a synchronized relation to operation of said dispensing mechanism.

3,885,661
PRINTING HEAD FEEDING MECHANISM FOR PRINTERS

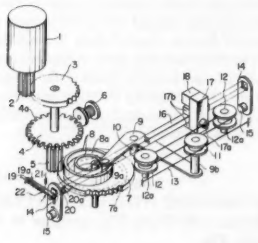
Katsuhiko Okabe, Tokorozawa, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-to, Japan

Filed Oct. 15, 1973, Ser. No. 406,339

Claims priority, application Japan, Oct. 18, 1972, 47-120297

Int. Cl. B41j *23/02*

U.S. Cl. 197—16 **2 Claims**



1. A printing head holder feeding mechanism for printers, comprising: an operating gear, a first cam member formed on said operating gear, a crank lever engaged with said first cam member and arranged to complete one to-and-fro motion by means of one rotation of said operating gear, an intermediate pulley rotatably mounted on one end of said crank lever, a pair of pulleys positioned at both sides of said intermediate pulley leaving a space between each other, a printing head holder movable between said pair of pulleys, a rope having an intermediate portion connected to said printing head holder and having extending portions respectively extended from said intermediate portion in the opposite direction and applied between each of said pair of pulleys and said intermediate pulley and further having a respective end of said extending portions held in fixed condition, one of said extending portions being shaped in S-shape and the other being shaped in reverse S-shape, a printing head connected to said rope and movable between said pair of pulleys, and a rail slidably supporting said printing head for linear movement of said printing head.

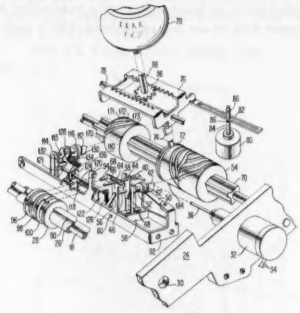
3,885,662
STEERABLE FOLLOWER SELECTION MECHANISM

John O. Schaefer, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,882

Int. Cl. B41j *1/60;* **F16h** *25/12*

U.S. Cl. 197—52 **7 Claims**



1. Selection apparatus for selecting a character on a single type element of a single element printing mechanism, comprising:

a cam control means having a single groove branching to form a plurality of branch grooves and said branch grooves terminating in said single groove;

means for rotating said cam control means through a complete revolution and returning said cam control means to a predesignated position;

a follower for engagement with said cam grooves;

means for deflecting said follower from said single groove to cause said follower to enter a selected one of said branches to cause relative axial motion between said cam and said follower along the axis of said cam;

said follower returning to said single groove when said control cam means is in said predesignated position;

means engaged by said cam control means to convert said caused relative motion to a rotational movement of said type element in accordance with and corresponding to the one of said grooves selected by said follower.

3,885,663
CONTROL DEVICE FOR TABULATION PRINTING

Masahiko Suzuki, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1973, Ser. No. 422,550

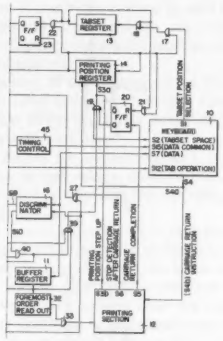
Claims priority, application Japan, Dec. 13, 1972, 47-124407

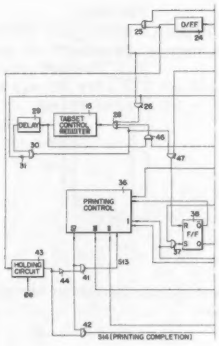
Int. Cl. B41j *25/18*

U.S. Cl. 197—176 **1 Claim**

1. A control device for tabulation printing comprising an input means of a printing data; a memory device for temporarily storing a printing data supplied by the input means; a printing means for printing the temporarily stored data in the designated column of a printing sheet; a tabset register for storing a plurality of tabset position signals defining the columns of the printing sheet; a discriminator for generating a first signal where the printing data only consists of digits and a second signal where the printing data includes at least a character; a means for reading out a signal denoting the lower order tabset position of the designated column from the tabset register and generating a signal designating the position where the foremost order of the temporarily stored data is to be printed, with reference to the readout signal and a signal denoting the number of orders of the printing data; a control means for controlling the printing means with reference to the first signal and a signal designating the printing position of the

foremost order such that where the input data only consists of digits, the highest order digit is impressed in the foremost printing position of the designated column of the printing sheet and the lowest order digit in the lower tabset position





side of said column; and a control means for controlling the printing means with reference to the second signal such that where the input data includes at least a character, the printing of said data is commenced from the higher order tabset position side of the designated column of the printing sheet.

3,885,664

TRANSPORT-DIRECTION REVERSING APPARATUS FOR AN AUTOMATIC MAIL HANDLING SYSTEM AND THE LIKE

Akira Fujimura, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 5, 1973, Ser. No. 404,049
Claims priority, application Japan, Oct. 5, 1972, 47-100442
Int. Cl. B65g *47/04*
U.S. Cl. 198—21 **3 Claims**

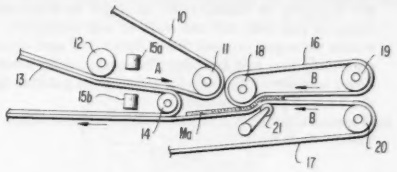
1. A transport-direction reversing apparatus for such flat articles as postal matter, comprising:

means for transporting a flat article in a first transport direction;

means for detecting said flat article;

a pair of endless belts moving in a second direction substantially opposite to said first direction, the distance between said belts being greater than a thickness of the thickest flat article to be processed; and

moving roller means installed in a space surrounded by one of said endless belts for reducing said distance between



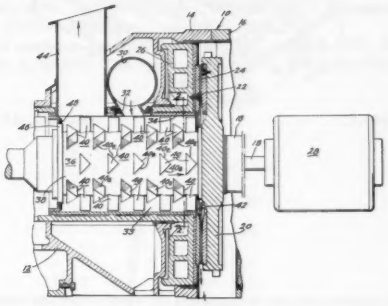
said endless belts in response to said detecting means so that said flat article fed from said transporting means is transported by said endless belts.

3,885,665

REVERSIBLE REFINER FEEDER

Chester Donald Fisher, Muncy, Pa., assignor to Sprout, Waldron & Company, Inc., Muncy, Pa.

Division of Ser. No. 296,564, Nov. 12, 1972, Pat. No. 3,853,276. This application May 23, 1974, Ser. No. 472,798
Int. Cl. B65g *33/00*
U.S. Cl. 198—110 **6 Claims**



1. A reversible conveyor for particulate material and the like comprising a cylindrical casing, a shaft rotatably mounted within said casing in radially spaced axially paralled relation thereto, said casing and said shaft defining a conveying chamber therebetween, a material inlet in said casing at one end of said conveying chamber, a material outlet in said casing at the opposite end of said conveying chamber, a plurality of conveying lugs fixed to said drive shaft and extending into said conveying chamber, said conveying lugs each having a pair of intersecting faces oppositely angularly inclined with respect to the axis of said shaft, the lug edge formed by said intersecting faces being directed toward said material outlet, said lugs upon rotation of said shaft serving to advance material introduced into said conveying chamber toward said material outlet regardless of the direction of shaft rotation.

3,885,666

STORAGE DEVICE FOR PALETTES CONTAINING AIR DRYING PAINTS AND VALUES

William J. Maxwell, Scottsdale, Ariz., assignor to Masterson Enterprises, Inc., Phoenix, Ariz.

Filed July 12, 1973, Ser. No. 378,585
Int. Cl. B44d *3/04, 3/02;* **B65d** *43/10*
U.S. Cl. 206—1.7 **2 Claims**

1. A storage device for palettes containing air drying paints and values comprising:

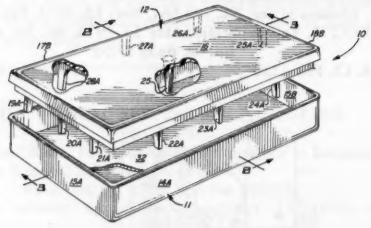
a shallow rectangular box comprising a base and side and end walls extending laterally from said base in the same

direction for forming a container for receiving one or more palettes juxtapositioned against its base,

a substantially flat cover having a lip around its periphery for engaging in substantially air tight arrangement the edges of said side and end walls of said container,

a means arranged around the periphery of said cover for extending into said container beyond said lip when said cover is mounted thereon for holding the palettes against the base of said container,

said means comprises a plurality of projections which taper toward their ends,



a tapered projection extending outwardly from the center of said cover in the same direction as said projections around the periphery of said cover,

the edges of said side and end walls being provided with a convex surface for engaging a concave pocket in said lip around the periphery of said cover to form substantially an air tight seal,

said lip around the periphery of said cover further comprising a flat surface projecting into said container along the surfaces of said side and end walls in sliding engagement therewith for aiding in providing a substantially air tight seal,

said flat surfaces of said lip wedgingly engages the surfaces of said side and end walls.

3,885,667

CARDED PACKAGE

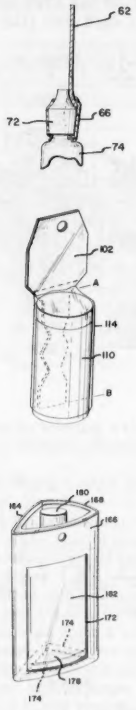
William Spiegel, Southampton; Jacob Spiegel, Philadelphia, both of Pa., and Albert Miller, Somerdale, N.J., assignors to Gilbreth Company, Cornwells Heights, Pa., by said Miller

Division of Ser. No. 138,056, April 28, 1971, Pat. No. 3,764,002. This application Feb. 28, 1973, Ser. No. 336,569

Int. Cl. B65d *65/16, 73/00*

U.S. Cl. 206—45.33 **6 Claims**

1. In a package including a bottle having a cap, said package including a heat shrinkable tube and a card, said card including a pair of slots therein spaced from one another to define a tongue therebetween, said tongue wrapping partially around said cap and including an opening receiving a portion of said cap therein, said tube being disposed about said tongue and



said cap and heat shrunk thereabout securing the bottle in place on said card.

3,885,668

APPARATUS FOR SORTING, CARRYING AND DELIVERING MAIL OR THE LIKE

Andrew J. McClain, 908 Alete St., Arlington, Tex. 76010

Filed Sept. 10, 1973, Ser. No. 395,400

Int. Cl. B65d *1/34, 7/00, 21/00*

U.S. Cl. 206—73 **10 Claims**

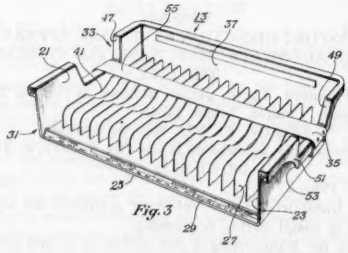


Fig. 3

1. Apparatus for sorting and carrying mail or the like comprising:

a. a plurality of sorting trays; said trays being adapted for insertion within a sorting bin for sorting of mail or the like into respective street addresses and being adapted for

being stacked into a delivery vehicle for delivering said mail or the like without re-sorting said mail; each said tray including:

i. two sloping ends and a rear side for stacking an upper tray inside of the top of a lower tray;

ii. a bottom;

iii. a plurality of partitions carried by said bottom so as to define mail slots therebetween, said partitions having means facilitating gripping the mail in said mail slots for removal of said mail;

iv. a label holder at the bottom of the front side of said tray, each label holder including a plurality of street and address slots, the latter being disposed between respective said partitions;

v. stacking means for supporting said trays in stacking relationship in said vehicle with the bottom of an upper tray supported above the top of said partitions in a lower tray;

vi. interlock means at each end of said trays for preventing an upper said tray from sliding out of its stacked relationship in engagement with a lower stacked tray;

vii. holding means removably connected with the ends of said tray and traversing over the mail therewithin for holding said mail in place and being removable for insertion of sorted mail within said tray; and

viii. sequence denoting means for facilitating ordering of said trays for a predetermined route.

3,885,669

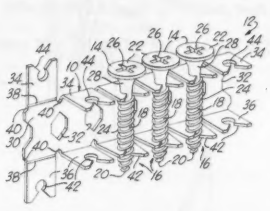
ROTARY ENTRY FASTENER CARRIER AND STRIP

Frank R. Potucek, Des Plaines, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Filed Apr. 29, 1974, Ser. No. 464,913

Int. Cl. B65d *85/24*

U.S. Cl. 206—338 **17 Claims**



1. A strip of rotary entry fasteners comprising a flexible plastic carrier including a web and pairs of tabs extending generally transverse to the web from opposite edges thereof, slots in the tabs, a plurality of fasteners having shanks frictionally and releasably retained in said slots, each shank including a threaded portion supported by a first tab of each pair and a spaced portion supported by a second tab of each pair, and the slot of each first tab having a fastener engaging portion narrower than the major thread diameter and wider than the minor thread diameter.

3,885,670

STORAGE CELL ASSEMBLY

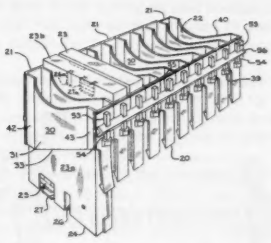
Bernard A. Cousino, Fort Myers, Fla., assignor to Cousino Corporation, Fort Myers, Fla.

Filed Nov. 9, 1973, Ser. No. 414,372

Int. Cl. B65d *1/34*; **A47g** *19/00*

U.S. Cl. 206—387 **2 Claims**

1. A cartridge storage cell assembly for use in a tape player apparatus comprising, in combination, a plurality of storage cases positioned in a side-by-side relationship, each of said storage cases including a panel, said panel having a top loading recess defined adjacent its upper end and a bottom loading recess defined adjacent its lower end, first and second sidewalls integrally attached to said panel, said first sidewall being substantially longer than said second sidewall, a flexible release finger extending downwardly from said second sidewall, an end cover panel positioned adjacent the last one of said



plurality of storage cases, and means on said first and second sidewalls and said end cover panel for retaining said plurality of storage cases and said end cover panel in assembled relationship.

3,885,671

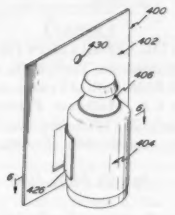
SECUREMENT OF BAND TO CARD

William Spiegel, Southampton; Jacob Spiegel, Philadelphia, both of Pa., and Albert Miller, Sommerdale, N.J., assignors to Gilbreth Company, Cornwell Heights, Pa.

Continuation-in-part of Ser. No. 138,056, April 28, 1971, Pat. No. 3,764,002. This application Jan. 10, 1973, Ser. No. 319,111

Int. Cl. B65d *73/00*

U.S. Cl. 206—460 **5 Claims**



1. A carded package comprising an article, a heat shrinkable tube and a planar card including a surface having a predetermined area with an adhesive material applied over said entire area, said area including a portion bent out of the plane of said card and conforming in shape to said tube, said article being disposed within said tube, with said tube being heat shrunk thereabout, and said (heat shrinkable) tube being adhesively secured to said entire predetermined area.

3,885,672

COMBINED STACKING RING AND CONTAINER COVER

Irmgard M. Westenrieder, 1145 East 166th Street, South Holland, Ill. 60473

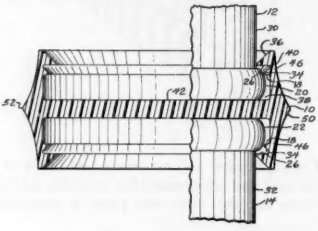
Filed Feb. 7, 1974, Ser. No. 440,373

Int. Cl. B65d *21/02*

U.S. Cl. 206—503 **5 Claims**

1. In combination, a pair of containers, each having at least one beaded end, and a molded plastic stacking device for stacking said pair of containers and engaging and retaining said beaded ends, said stacking device comprising an imperforate, substantially planar center portion defined at its periphery by oppositely axially extending annular flange portions, said flange portions each including a pair of integral, spaced annular ridges having their apexes directed generally

radially inwardly and having their axially outermost walls directed toward said planar center portion, the intermost ridge of each of said pair of ridges extending radially inwardly to a lesser extent than the outermost ridge, each of said intermost ridges engaging and retaining the end bead of one of said pair of containers and each of said outermost ridges engaging the side wall of one of said pair of containers, said intermost ridges being axially spaced from said planar center portion and having an inner diameter less than the maximum diameter of the beaded end of the container with which it is engaged.



3,885,673

ELECTROSTATIC SEPARATION OF POTASH ORES

Robert Berthon, Wittelsheim, Haut-Rhin, and Michel Bichara, Richwiller, Haut-Rhin, both of France, assignors to Mines de Potasse d'Alsace S.A., Mulhouse, France

Filed July 26, 1968, Ser. No. 747,788

Claims priority, application France, July 28, 1967, 67.116039

Int. Cl. B03b *1/00*

U.S. Cl. 209—9 **14 Claims**

1. In an electrostatic process for the beneficiation of potash ore containing intermingled crystals of sylvite and halite and insoluble impurities, the improvement comprising conditioning said ore before electrostatic separation with:

a. an aliphatic amine of 8–22 carbon atoms, and

b. an ammonium salt of a lower aliphatic carboxylic acid of 1–4 carbon atoms whereby a concentrate is obtained having a higher proportion of sylvite to insoluble impurities.

3,885,674

ANTI-THEFT SECURITY CHAIN

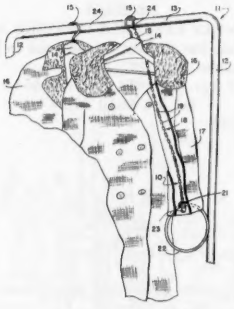
Thomas Rosenberg, and Harold Rosenberg, both of 144-150 W. 18th St., New York, N.Y. 10011

Filed July 17, 1973, Ser. No. 379,937

Int. Cl. E05b *73/00*

U.S. Cl. 211—4 **1 Claim**

1. An anti-theft security chain exclusively for a standard garment rack fixture of the type usual to a retail store and the like, said anti-theft security chain being for use only with garments having sleeves, said rack fixture being of the type that includes a horizontally disposed bar on the upper portion thereof, a plurality of hangers each having a hook portion loosely and freely engaging the top bar of said rack fixture, garments mounted on said hangers, each of said garments including sleeves of hollow formation, a chain projecting through a sleeve of the garment and said chain having a portion that is freely wrapped and looped over the bar of said rack fixture and wherein the looped wrapped portion permits the chain to be moved along the horizontally disposed bar as well as permitting convenient removal of the chain from the bar, said chain comprising a plurality of interfitting, interconnected small links, said chain including a top link and a lower link, the top link of each chain having an enlarged formation thereby allowing the upper portion of the chain to be extended through the top link of the chain, the anti-theft security chain providing a choke effect on the bar so that the upper portion thereof can not be removed from the rack, a lock detachably connected to the lower link of said chain, a retainer connected to said lock, said retainer including an enlarged open ring member having a greater size than the diameter of the sleeve of the garment, said ring member being positioned contiguous to the lower outer end of said sleeve, said ring member having an open interior and said ring member having a loose free connection to said lock, the main portion of the chain hanging down by gravity due to the weight of the retainer, and wherein said anti-theft security chain permits a prospective purchaser to examine and handle the garment but preventing the garment from being removed from the rack fixture until the lock is manually unlocked, said chain having a length that is sufficiently large enough to permit the chain to be looped over the top bar, said chain being free of sharp edges so that damage to the garment will be prevented and wherein the links of the chain provide a smooth construction so that the links will not snag the garment lining, said retainer being sufficiently large enough so that it can not be pulled back through the sleeve, and wherein when a rack of clothes is being displayed the only garment that will show the anti-theft security chain is the end garment so that the overall appearance of the garments being displayed will not be spoiled, said ring member being of sufficient strength and weight so that it can not be compressed whereby unauthorized removal can be prevented, said anti-theft security chain being usable with the conventional garment rack fixture without requiring any alteration to the rack fixture, said anti-theft security chain being solely for use with garments and articles of clothing to be worn.



3,885,675

CONSTRUCTION KIT FOR THE ERECTION OF STORAGE AND DISPLAY STRUCTURES OF VARYING DIMENSIONS IN THE FORM OF SHELVES, CUPBOARDS, DISPLAY CASES AND THE LIKE

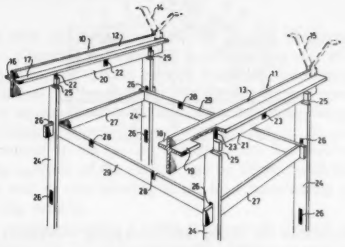
Gladys E. K. Hultenby, Vasterlanggatan 58, 111 29 Stockholm, and Patric C-O. Hellberg, Jakobsbergsgatan 5, 111 44 Stockholm, both of Sweden

Filed Dec. 27, 1973, Ser. No. 428,679

Claims priority, application Sweden, Dec. 28, 1972, 17978/72

Int. Cl.[2] A47F *5/08*

U.S. Cl. 211—118 **12 Claims**



7. The collapsible structure of claim 6 wherein said main bars are made of aluminum.

3,885,676

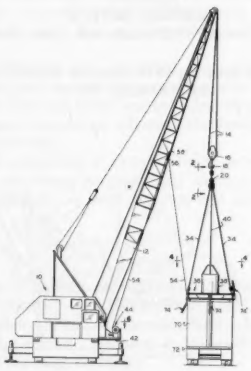
CRANE SYSTEM FOR CARGO CONTAINERS

Lester W. Wilson, Portland; Joseph H. Tracy, Troutdale, and Clarence C. Wilson, Portland, all of Oreg., assignors to Lester W. Wilson and Clarence C. Wilson, both of Portland, Oreg.

Filed Apr. 20, 1973, Ser. No. 352,876

Int. Cl. B66c *1/00*

U.S. Cl. 212—44 **11 Claims**



1. A crane system for moving a cargo container, said system comprising:

a crane having a crane boom and a crane operator's cab,

a container head adapted to be received upon the top of said container, said container head having four remotely operated locking members located substantially at corners of said container head for engaging mating locking devices provided at the top of a container,

cable means for suspending said container head and container locked thereto from said crane boom,

a first group of four switching devices located on the container head and responsive to the container's presence for preventing unlocking of said locking members when said container head is not resting on said container,

four additional switching devices located on the container head and responsive to operation of said locking members,

and indicating means located in the operator's cab and electrically coupled to said container head for indicating to the crane operator the position of said first group of four switching devices and the position of said four additional switching devices,

whereby, when the crane lifts the container, said container head is not resting on said container and upon lowering of the container onto a supporting surface said container head rests on the container and said indicating means thereby provides an indication to an operator in said operator's cab that the container is fully down on the said supporting surface.

3,885,677

TRAVELING CRANE CONSTRUCTION

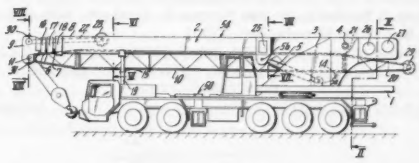
Richard Gorl, and Helmut Blase, both of Dortmund, Germany, assignors to Rheinstahl Aktiengesellschaft, Germany

Filed Jan. 4, 1974, Ser. No. 430,723

Claims priority, application Germany, Jan. 8, 1973, 2300643

Int. Cl. B66c *23/06*

U.S. Cl. 212—59 R **7 Claims**



1. A traveling crane, comprising a support base, an upper chassis rotatable on said support base, a twin jib pivoted adjacent its one end on said upper chassis and having two laterally spaced single jib portions each with a plurality of telescopic sections having outer ends opposite to the inner end of said twin jibs, said twin jibs being telescopically extensible in unison, head traverse means interconnecting said telescopic sections having a receiving head recess defined between said single jib portions, a head connected to the outer ends of said telescopic sections, and a head jib articulated to said head and being positionable in a collapsed transport position between said single jibs in said head receiving recess in substantially horizontal and parallel relationship, said head including a ball and socket mounting for said head jib, said head jib being connected to said ball and socket mounting in a collapsed transportable position in which it is received in the recess.

3,885,678

MATERIAL HANDLING APPARATUS

Sven Christer Borg, Handen; Christer Ragnar Hesson, Johanneshov, and Erik Henning Nilsson, Trangsund, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Oct. 15, 1973, Ser. No. 406,593

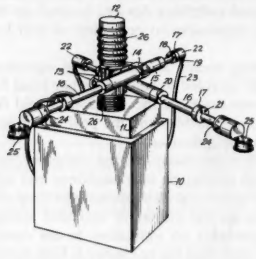
Claims priority, application Sweden, Oct. 18, 1972, 13470/72

Int. Cl. B66c *1/42*

U.S. Cl. 214—1 BB **12 Claims**

1. A material handling apparatus for the transfer of work pieces from one predetermined position to another predetermined position comprising at least one unit for movement

along its longitudinal axis and an additional assembly having a unit for vertical movement and a unit for rotary movement, the latter being adapted to transfer said work pieces in a substantially horizontal plane, said additional assembly being provided with at least one exchangeable and adjustable holder



for setting the corresponding longitudinally moving unit in the selected position relative to said additional assembly, said holder having an adjustment device provided with means to lock said longitudinally moving unit at an adjustable distance from the additional assembly and at an adjustable angle to said horizontal plane.

3,885,679

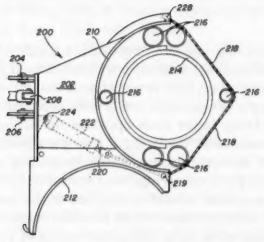
RACHING ARM FOR PIPE SECTIONS, DRILL COLLARS, RISER PIPE, AND THE LIKE USED IN WELL DRILLING OPERATIONS

John J. Swoboda, Jr., and Norman L. Swoboda, both of P.O. Box 1939, Victoria, Tex. 77901

Division of Ser. No. 377,321, July 9, 1973, Pat. No. 3,840,128. This application Jan. 17, 1974, Ser. No. 434,200

Int. Cl. B65g *47/08*

U.S. Cl. 214—1 BD **4 Claims**



1. In a racker arm system for guiding elongated pipe members used in well drilling operations wherein an extendible boom has a free end movable to a plurality of locations in the region of the drilling platform, the combination comprising:

a pipe gripper mounted on the free end of said boom and including a gripper base having a semicircular cutout portion for receiving a first peripheral portion of a vertical pipe,

a flexible elongated member attached at one end to said gripper base and having a free end, said member being of sufficient length to be wrapped about said second peripheral portion of the vertical pipe in order to limit lateral movement of said pipe,

means for attaching said free end of said flexible member to said gripper base,

means for sensing the vertical attitude of said boom, and

means for moving said gripper relative to said boom to maintain said gripper at a predetermined orientation during movement of said boom.

3,885,680

APPARATUS PROVIDED AT PRESSES FOR THE LIFTING AND CONVEYING OF WORKPIECES

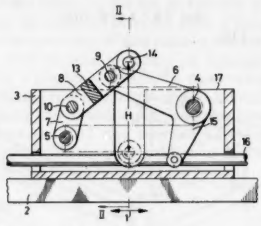
Otto Rasenberger, Goppingen, Germany, assignor to L. Schuler GmbH, Germany

Filed Apr. 1, 1974, Ser. No. 456,856

Claims priority, application Germany, Mar. 30, 1973, 2315950

Int. Cl. B65g *25/04*

U.S. Cl. 214—1 BB **21 Claims**



1. Apparatus for lifting and conveying workpieces in a machine tool or the like, comprising:

a bar reciprocably movable in the machine tool,

and at least one work handling fixture attached to and movable with said bar, said work handling fixture including a lifting element directly engageable with a workpiece and a drive system for effecting workpiece lifting movements of said lifting element,

wherein said drive system includes a driven lever and a rocker arm which are pivotal about mutually parallel axes and are joined together by a coupler means attached to said lifting element, said driven lever being pivotally joined to said coupler means at a position intermediate the attachment point of said lifting element and coupler means and the junction point of said coupler means and rocker arm.

3,885,681

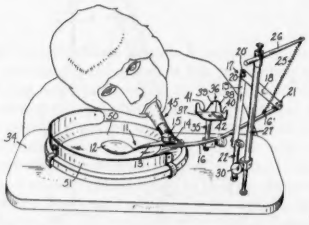
FEEDING DEVICE

Pasquale M. Mancino, 182 Beach Ave., East Haven, Conn. 06512

Filed June 28, 1974, Ser. No. 483,955

Int. Cl. A61j *7/00*

U.S. Cl. 214—1 T **7 Claims**

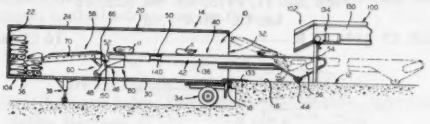


1. A feeding device for no-hand operation comprising, a spoon having a bowl and a handle, a mouthpiece assembly connected to said handle and projecting laterally therefrom, counterbalancing means connected to said spoon and mouthpiece assembly to support at least a portion of the weight thereof, and a cradle mounted adjacent said counterbalancing means and adapted to support the balance of said weight when the spoon and mouthpiece assembly are rested thereon.

3,885,682
MAIL BAG HANDLING APPARATUS

Joseph E. McWilliams, 1345 Canterbury Ln., Glenview, Ill. 60025

Continuation of Ser. No. 306,006, Nov. 13, 1972, abandoned.
This application July 15, 1974, Ser. No. 488,502
Int. Cl. B65g *57/12, 67/08*
U.S. Cl. 214—6 G 5 Claims



1. In bulk handling apparatus for moving elongated bags between a loading dock and the load receiving area of an end loading transport vehicle backed into load transferring relation adjacent the loading dock to dispose its end opening to pass the bags therethrough, said apparatus comprising:

an elongate wheeled conveyor adapted to be movably mounted on the loading dock adjacent the load transferring position of the vehicle and be aligned with the vehicle and its end opening in the load transferring position of the vehicle,

said conveyor having a width transversely thereof that approximates the width of the mail bags,

said conveyor having a forward end that faces the vehicle when aligned therein and a rearward end extending oppositely of said forward end thereof,

said conveyor at said forward end including a forward wheel assembly,

said forward wheel assembly comprising:

a frame secured to said conveyor and defining a pair of spaced apart legs each journaling a wheel on which said frame and said conveyor ride,

said frame including a vertically disposed spindle journaled for pivotal movement about its longitudinal axis, said spindle axis being substantially aligned with the longitudinal centerline of said conveyor,

said spindle having mounted thereon a conveyor head for movement about a horizontal axis extending transversely of said head,

said head projecting forwardly of said conveyor,

means for swinging said head about said spindle axis to swing said head from side to side relative to said conveyor,

and an adjustable strut structure connected between said head and said spindle for supporting said head cantilever fashion from said frame and including means for adjusting the length thereof for adjusting the forward end of said head vertically,

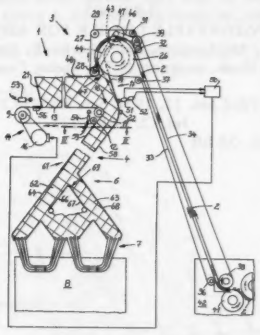
said head comprising an elongate frame mounting conveyor means extending longitudinally thereof for conveying mail bags between said conveyor and said head forward end.

3,885,683
APPARATUS FOR TEMPORARY STORAGE AND TRANSPORT OF CIGARETTES OR THE LIKE

Ulrich Bornfleth; Fritz Selonke, and Horst Scharnetzke, all of Hamburg, Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed June 14, 1973, Ser. No. 369,954
Claims priority, application United Kingdom, June 21, 1972, 29049/72; Sept. 19, 1972, 43421/72; Feb. 20, 1973, 8152/73
Int. Cl. B65g *37/00*
U.S. Cl. 214—17 CA 16 Claims

1. Apparatus for transporting rod-shaped articles from a source to a consumer, particularly for transporting rod-shaped smokers' products from at least one producing machine to at least one packing or other processing machine, comprising a plurality of successive units defining an elongated path extending from said source to said consumer, said units including a first unit constituting a variable-capacity reservoir arranged to store a variable supply of articles and having an inlet for admission of articles into and an outlet for discharge of articles from the interior thereof, said reservoir comprising a first end wall adjacent to said inlet, a second end wall located opposite said first end wall, displacing means actuatable to move said second end wall toward and away from said first end wall to thereby change the capacity of said reservoir, and

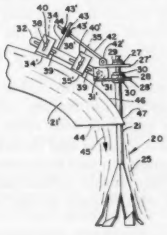


actuating means for said displacing means including pressure-responsive feeler means, said feeler means including said first end wall and said first end wall being movable by the articles of said supply between a plurality of positions each of which is indicative of a different number of articles in said supply, said units further including a second unit constituting feeding means for moving the articles from said source to said inlet, said path having a downwardly extending portion along which the articles move toward said inlet and said feeding means including conveyor means for positively engaging and moving the articles between said source and said inlet.

3,885,684
SILAGE SPREADER

Lester R. Mitchell, Rt. 1, Detroit Lakes, Minn. 56501

Filed June 27, 1974, Ser. No. 483,695
Int. Cl. B65g *65/32*
U.S. Cl. 214—17 CB 1 Claim



1. A silage spreader device for attachment to the outlet spout of a silage harvester to spread the silage about a silage bin as it comes out of the outlet spout, said spreader comprising a shaft adapted to be rotatably mounted to the outlet spout so that the lower end of the shaft is suspended beneath the outlet spout in the path of silage coming out of said spout, a plurality of blades coming to a point about the shaft and extending outward and downward diverging relative at a uniform angle to one another in a cone-like shape with the lower portions of the fins separated and spaced from one another,

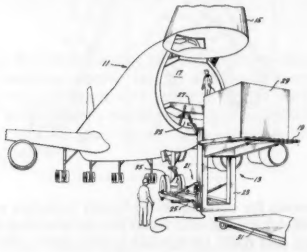
and with the lowermost ends of the fins angled to one another, so that as silage drops out of the outlet spout some of the silage will engage the angled portions of the fins and cause the spreader to rotate relative to the outlet spout and to toss the silage outward as some of the silage engages the angled fins, the rotation of the fins will act to toss the silage outward in an arc, with the spaces between the fins enabling some of the silage to drop between the fins and be deposited in the central portion of the bin.

3,885,685

TRANSPORTABLE LOADER FOR AIRCRAFT

Howard W. Montgomery, and Charles R. Stanley, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 17, 1974, Ser. No. 434,294
Int. Cl. B64d *9/00*
U.S. Cl. 214—38 BB **9 Claims**



1. A collapsible transportable loader for raising and lowering cargo between the cargo deck of a nose-loading cargo aircraft having a nose wheel structure located rearwardly of a nose access opening allowing access to the cargo deck of the aircraft and some other predetermined level, said collapsible transportable loader comprising:

a horizontal support member;

first attachment means located at one end of said horizontal support member and suitable for attaching said horizontal support member to the nose wheel structure of a nose-loading cargo aircraft;

a vertical support member rotatably attached to the end of said horizontal support member opposite to the end associated with said first attachment means;

second attachment means for attaching the upper end of said vertical support member to the bulkhead of said nose-loading cargo aircraft in the region generally defined by the nose access opening;

collapsing means associated with said horizontal and vertical support members for rotating said horizontal and vertical support members with respect to one another between a position whereat said vertical support member lies in a plane parallel to said horizontal support member and a position whereat said vertical support member lies at a right angle with respect to said horizontal support member;

an elevator platform suitable for supporting cargo;

elevator means associated with said vertical support member and said elevator platform for raising and lowering said elevator platform between the level of said cargo deck of said nose-loading cargo aircraft and some other level; and,

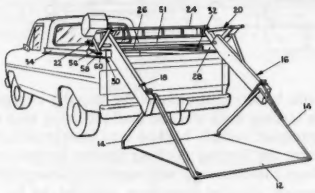
third attachment means for rotatably attaching said elevator platform to said elevator means on the side of said vertical support member opposite to said horizontal support member and in a manner such that said elevator platform is rotatable between a position whereat said elevator platform lies in a plane parallel to said vertical support member and a position whereat said elevator platform lies at a right angle with respect to said vertical support member.

3,885,686

POWER LIFTING ATTACHMENT FOR VEHICLES

Barton G. Siebring, Grand Rapids, Mich., assignor to Simon M. Oppenhuizen, Grand Rapids, Mich.

Filed Jan. 11, 1973, Ser. No. 322,765
Int. Cl.² B60P *1/48*
U.S. Cl. 214—77 R **16 Claims**



14. A power lifting apparatus for vehicles comprising in combination:

first and second tracks;

means for mounting said tracks on a vehicle;

first and second carriages mounted on said first and second tracks respectively for movement therealong;

first and second lifting arms each being hollow substantially along the length thereof and pivotably mounted on a horizontal axis on said first and second carriages, respectively in spaced relationship to each other for rotational movement on said carriages;

a platform;

means for supporting said platform on the free ends of said first and second lifting arms; and

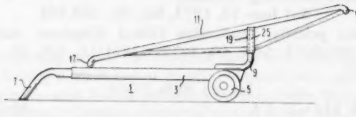
means for maintaining said platform level as said lifting arms are rotated about their pivotable mountings on said carriages, said means for maintaining said platform level including a first guide means with a curved upper surface having a center of curvature on the pivotable mounting axis of said first arms, a cable drawn over the curved surface and rigidly coupled to said first guide means, said cable passing through the interior of said hollow arm, a second guide means with a curved upper surface of the curvature to the first guide means curved surface rotatably mounted within the free end of said first lifting arm and secured nonrotatably to said platform supporting means, said cable being drawn over said curved surface of the second guide means and means for rigidly coupling said cable to said second guide means so that said cable is maintained taut as said first lifting arm rotates and so as to maintain said platform support means angularly fixed with respect to said first support means.

3,885,687

HANDTRUCK ADAPTER FOR HANDLING LONG HEAVY OBJECTS

Seymour E. Blas, 54 Linderman Ave., Kingston, N.Y. 12401

Filed June 7, 1973, Ser. No. 367,846
Int. Cl. B62b *1/04*
U.S. Cl. 214—372 **4 Claims**



1. An adapter designed for attachment to a handtruck for moving long cylindrical objects by an individual comprising a

frame of tubular material having a pair of side members and a pair of end members, said end members being contoured for holding said cylindrical objects in position on said support member, a laterally spaced support member substantially perpendicular to said side members, further support members extending from said laterally spaced support member to different locations on said tubular frame, means connecting said support members to said frame and means for attaching said adapter to the blade of said handtruck.

3,885,688

DEVICE FOR LAYING FLAGSTONES

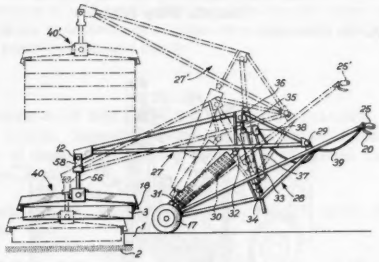
Albert Johannes Larsen, Roskildevej 52, Vaerebro, 3650 Oelstykke, Denmark

Filed Sept. 1, 1972, Ser. No. 285,569

Claims priority, application United Kingdom, Sept. 2, 1971, 41083/71; July 11, 1972, 32418/72; Denmark, Aug. 7, 1972, 3885/72

Int. Cl. B60p *1/54*

U.S. Cl. 214—384 **7 Claims**



1. A device for laying of flagstones or the like block-formed paving elements comprising:

a double-armed lever structure comprising a main frame being at its front end provided with supporting means adapted for resting on a supporting surface so as to allow tilting of the structure about a transverse axis and at its rear end provided with means for manoeuvring the device by hand or by mechanically driven manoeuvring means;

a beam being at its rear end connected to said main frame pivotally about a transverse axis and with its front end extending in front of said supporting means and carrying pivotally about a transverse axis a pair of tongs adapted for temporary carrying a flagstone or the like paving elements in a horizontal position;

spring means for lifting the beam in relation to the frame when in unloaded condition;

and means for selectively controlling the movement of the beam in relation to the frame.

4. A device for the laying of flagstones, block-formed paving elements, and the like, comprising, in combination,

a double-armed lever structure carrying at its front end pivotally about a transverse axis a pair of tongs adapted for temporarily carrying a flagstone or the like in a horizontal position

said double-armed lever structure being provided at its rear end with means for manoeuvering the device by hand or by powerdriven manoeuvering means

said double-armed lever structure being also provided with supporting means adapted for resting on a supporting surface so as to allow tilting of said structure about a transverse axis.

a fitting for suspending the pair of tongs pivotally from said double-armed lever structure including a suspending bolt said fitting being provided with two sets of bores for the suspending bolt arranged perpendicularly to each other in a horizontal plane so as to suspend the pair of tongs either with the arms in the longitudinal direction of the device or perpendicularly to said direction, abutment means connected to said tongs for abutting the top of the said flagstones, block-formed paving elements and the like, whereby the contact between said tongs and said flagstones, block-formed paving elements and like can be varied.

3,885,689

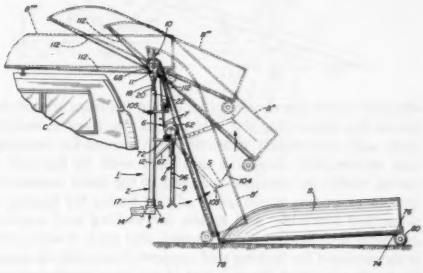
BOAT LOADING AND UNLOADING APPARATUS

Hiram D. Grove, 8700 Mentor Rd., R.R. 1, Mentor, Ohio 44060, and Harry A. Sauders, 108 Sholle Dr., Hudson, Ohio 44236

Filed Oct. 11, 1973, Ser. No. 405,428

Int. Cl. B60p *3/10*

U.S. Cl. 214—450 **14 Claims**



1. An apparatus for loading a boat onto a carrier comprising,

a support,

winch means on said support including a retractable loading element for lifting said boat off of the ground,

fulcrum means on said support for movingly supporting said boat thereon,

means for connecting the distal end of said loading element to one end of said boat for lifting said boat by said winch means,

releasable guide means releasably connecting the opposite end of said boat to said loading element inwardly from the distal end of said loading element for lifting the opposite end of said boat into engagement with said fulcrum means,

said guide means includes a guide receptacle for releasing said opposite end of said boat from said loading element after engagement of said opposite end of said boat with said fulcrum means to enable said boat to be moved upwardly and along said fulcrum means by said loading element upon continued actuation of said winch means,

booster means of said support selectively engaging said boat adjacent said one end after said opposite end has been moved into engagement with said fulcrum means, and

said booster means coacts with said fulcrum guide means to pivot said boat from said generally vertical position into a generally horizontal position upon continued actuation of said winch means for placement of said boat in a generally horizontal position on said carrier.

3,885,690

TRAILER FOR SNOWMOBILES

James J. Van Slambrouck, Riverview, Mich., assignor to Warren Burke, Lincoln Park, Mich.

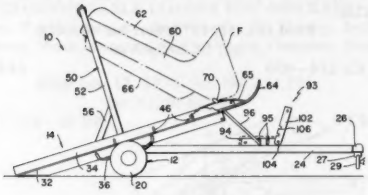
Continuation of Ser. No. 236,381, March 20, 1972. This application Dec. 13, 1973, Ser. No. 424,219

Int. Cl. B60p *1/28*

U.S. Cl. 214—506 **4 Claims**

1. A trailer for carrying snowmobiles in tandem, comprising a supporting assembly having ground-engaging wheels, a sup-

ported assembly mounted on said supporting assembly comprising a deck, and means for securing snowmobiles in tandem on said deck with their longitudinal axes extending lengthwise of said deck comprising means for securing the forward end of a front snowmobile down on said deck, means for securing the rear end of the front snowmobile in elevated position spaced above said deck comprising an inverted U-shaped frame having laterally spaced uprights mounted on opposite sides of and extending upwardly from said deck, a transversely extending bar connecting the upper ends of said uprights and



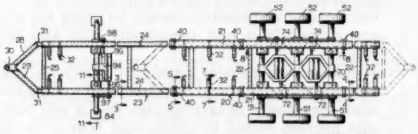
disposed above the elevated rear end of the front snowmobile, means for suspending the rear end of the front snowmobile from said transversely extending bar, means for securing a rear snowmobile down on said deck with its forward end nested under the elevated rear end of the front snowmobile, an axis extending transversely of said trailer for tipping said supported assembly, and means for locking said supported assembly in a first position in which said deck is substantially horizontal and for locking said supported assembly in position for loading in which the rear end of said deck is tilted adjacent ground level.

3,885,691

MOBILE HOME CARRYING TRAILER

Maynard Bill Knapp, Salisbury, N.C., assignor to Knapp Corporation, Salisbury, N.C.

Filed May 16, 1974, Ser. No. 470,674
Int. Cl. B60p *1/02*
U.S. Cl. 214—512 **6 Claims**



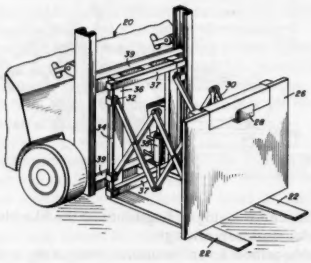
1. A carrier for transporting a single-wide or half of a double-wide mobile home or modular home constructed without wheels and steel underframe, comprising a stationary frame having a pair of parallel hollow box beams and fixed cross braces between them securing them to each other, an adjustable frame comprising a pair of parallel beams slidable telescopically in the stationary box beams of the stationary frame and having removable cross brace between them securing them to each other, lock means locking the frames to each other in any of a plurality of positions, a plurality of pairs of wheels and an axle extending between each pair of wheels, a wheel chassis slidably mounted on said axles for movement in the direction of the length of said axles, said stationary frame being mounted on said wheel chassis for vertical movement relative to said wheel chassis and extending transversely to the direction of length of said axles, an outrigger housing adjacent the end of the adjustable frame remote from the stationary frame extending substantially parallel with said axles and having outrigger support means depending therefrom for contact with the ground beneath the carrier, outrigger slide means slidably mounted on said outrigger housing, the adjustable frame being mounted on said outrigger slide means for vertical movement relative to said outrigger slide means and extending transversely to the direction of length of said outrigger housing, raising and lowering means between the wheel chassis and the stationary frame and between the outrigger housing and the adjustable frame for raising and lowering the frames together, and lateral shifting means between said axles and said wheel chassis and between said outrigger housing and said outrigger slide means for shifting the wheel chassis and the outrigger slide means together in one or the other direction transversely of the length of the frames, whereby the frames can be shifted up and down relative to the wheels and the outrigger housing and can be shifted laterally back and forth relative to the wheels and the outrigger housing for adjusting the position of the mobile or modular home or a part of it at the installation site.

3,885,692

HANDLING SYSTEM FOR INTERLOCKING COVER BOXES

Seymour Clarence Anderson, Jr., Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Mar. 26, 1973, Ser. No. 344,775
Int. Cl. B60p *1/02*
U.S. Cl. 214—514 **4 Claims**



1. Load handling apparatus for a vertically adjustable lift truck support unit including a rear truck engaging portion and horizontal support means projecting forwardly therefrom and terminating in a forward edge selectively introducible beneath a load to be supported; said apparatus comprising a positioning panel overlying said horizontal support means and projecting vertically thereabove; means mounting said positioning panel for horizontal movement over said support means between a first forward position adjacent the forward edge and a second position sufficiently rearward of the forward edge to accomodate a load on the horizontal support means between the positioning panel and the forward edge; power means for effecting movement of the positioning panel between the first and second positions thereof; load engaging means on said positioning panel selectively engageable with a load for a controlled movement of a load with the positioning panel relative to the horizontal support means; means for effecting a vertical adjustment of the load engaging means relative to the positioning panel; and said load engaging means having an upwardly directed blade engageable beneath a top cap upon vertical adjustment of said blade whereby the carton can be both gripped and upwardly tipped and the load can be selectively drawn onto and pushed from the support means.

3,885,693

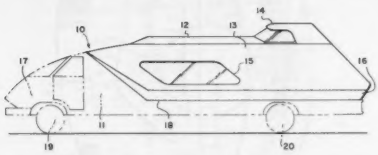
COMBINATION VEHICLE AND BOAT

Jimmie L. Haptonstall, 411 Ridgeview, Rockwall, Tex. 75087

Filed Jan. 19, 1973, Ser. No. 325,094
Int. Cl. B60p *1/36*
U.S. Cl. 214—516 **2 Claims**

1. A combined vehicle and boat comprising a prime mover having an open topped bed at the rear end therof; a wheeled

cradle having a pair of support wheels slideably mounting said cradle on said open topped bed for displacement rearwardly to a position behind said prime mover, said support wheels being pivotally connected to said cradle for downward movement to a ground engaging position upon said rearward displacement; a box-like beam having a longitudinal slot in the top thereof and mounted in said bed longitudinally and forming a guide track therealong; a dolly running within said guide



track; connecting means projecting through said slot and being connected to the front end of said wheeled cradle; said dolly and said connecting means comprising a guide means; drive means for driving said guide means forwardly and backwardly along said guide track; and a boat hull, so proportioned with respect to said vehicle that one fairs into the other and presents the appearance of a unitary structure when said boat hull is positioned on said cradle.

3,885,694

THREE-WAY BUCKET ASSEMBLY FOR LOADER

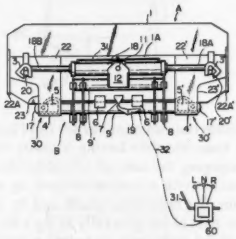
Tomio Uchida, Sagamihara, and Kisaburo Otabe, Isehara, both of Japan, assignors to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Oct. 24, 1973, Ser. No. 409,331

Claims priority, application Japan, Oct. 25, 1972, 47-106206

Int. Cl. B66f *9/00*

U.S. Cl. 214—768 **8 Claims**



1. In a three-way bucket assembly for an earth moving machine comprising a dump bucket and a dump bucket support, the improvements characterized in that the dump bucket is provided with first and second connecting means displaced at each of its rear sides, respectively, the bucket support comprises at least one plate connected with lift arms of the earth moving machine, at least one frame is secured to the plate and laterally extended, a double rod type hydraulic cylinder, the center of which is pivotally mounted on the center of the frame and is laterally extended, is provided with third connecting means disposed at the outer ends of each rod of the cylinder, and fourth connecting means, disposed at both ends of the frame, are provided with pivot pins whereby at standard conditions when the hydraulic cylinder is at rest, each of the first connecting means is engaged with each of the third connecting means and each of the second connecting means with each of the fourth connecting means; the hydraulic cylinder, when actuated in either direction, moves the bucket laterally relative to the bucket support in the direction a given amount to release the locking of the second and fourth connecting means located backwardly of the dump bucket and thereafter begins to turn the bucket about the pivot pin of fourth connecting means located forwardly of the bucket while releasing the locking of the first and third connecting means located backwardly of the bucket.

3,885,695

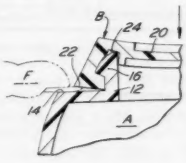
SNAP-ON SAFETY CLOSURE FOR CONTAINERS

Robert Bey Schaefer, Malvern, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 276,181, July 28, 1972, Pat. No. 3,830,393. This application May 29, 1974, Ser. No. 474,473

Int. Cl. B65d *55/02;* **A61j** *1/00*

U.S. Cl. 215—224 **12 Claims**



1. A dispensing container having a snap-on closure resistant to removal by small children comprising

a body portion including a tubular neck projecting from an extended shoulder portion, said tubular neck having a bead means in the form of an annular ridge circumscribing an exterior surface of said tubular neck, said bead means being in concentric disposition with an open end of said tubular neck which serves as the opening for the container, said bead means being suitably configured for engaged, interlocking relation with a groove means disposed on a cap for closing the container,

a cap of flexible material including a center portion and a skirt, said skirt having an internal dimension complementary with the exterior of said neck and an exterior perimeter smaller than the periphery of said shoulder portion,

groove means, disposed on an internal surface of said skirt and suitably disposed for engaged interlocking relation with said bead means, for detachably locking said cap on said neck so that the margin of the skirt abuts entirely against said shoulder portion,

the exterior of said cap being so configured and arranged when in locked disposition on said neck as to render grasping thereof by one's fingers difficult, and

a pressure zone at the center of said cap for affecting a bowing couple in said cap when pressure is applied downward on the center of the cap,

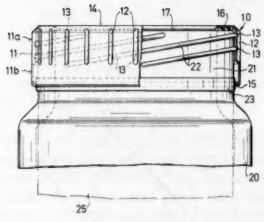
wherein said skirt is disposed with respect to said center portion that when said cap is in engaged relation with said body portion, by having been snapped on said body portion, the application of a suitable downward force upon said pressure zone, creating a bowing couple in said cap, will result in said skirt moving slightly away from said shoulder portion, as said skirt groove means rotates slightly about said bead means, said movement of said skirt away from said shoulder portion creating only a small space into which one may insert one's fingernail and pry said cap from said body portion.

3,885,696

CLOSURE CONSTRUCTION FOR CONTAINER WITH LID

Heinrich Eberhardt, Gasstrabse 9, 221 Itzehoe/Holst., Germany

Filed Oct. 29, 1973, Ser. No. 410,337
Claims priority, application Germany, Nov. 4, 1972, 2254034
Int. Cl. B65d 41/04
U.S. Cl. 215—337 2 Claims



1. A closure and container combination comprising a container having a cylindrical neck with a top opening and a substantially flat rim surrounding the top opening, a male thread projecting outwardly around the side of said neck extending inwardly from said rim, an annular cylindrical ring formation on said neck spaced inwardly from said male thread, a container closure lid having a recessed central portion closing the neck opening, a raised peripheral annular portion overlying said rim and a cylindrical depending skirt portion extending inwardly from said rim, an annular ceiling insert disposed between said lid raised peripheral annular portion and said rim, said lid cylindrical skirt portion having an upper section adjacent said rim with circumferentially spaced vertically extending inwardly projecting corrugations which are malleable and deformed to define a female thread when engaged on said male thread, said lid skirt having a lower section with the same diameter as the upper section but free of corrugations and connected to said upper section and being at least one third the length of said upper section, said lower section having a lower edge with an inwardly directed flange circumferentially engaging said ring formation and centering the lid as it is threaded to said container.

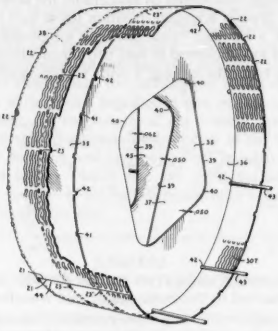
3,885,697

BEAN SNIPPER MACHINE

Joe R. Urschel, 202 Michigan, Valparaiso, Ind. 46383

Filed Aug. 14, 1972, Ser. No. 280,494
Int. Cl. B65d 85/00
U.S. Cl. 220—22 8 Claims

1. A subassembly comprising: a cylinder having a peripheral surface provided with circumferentially spaced circumferentially extending zigzag slots and with circumferentially spaced openings, and a round apertured planar partition disposed in said cylinder and provided with circumferentially spaced means disposed in said openings whereby said partition is



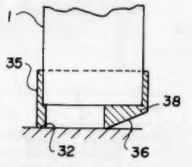
locked in said cylinder in a plane transverse to its longitudinal axis.

3,885,698

CONTAINERS FOR AEROSOLS, GASES AND THE LIKE

Constantin Erwin Lebel, 107, Avenue de Saint-Quen, 75017 Paris, and Pierre Ilie Isidore Karmitz, 95, Avenue Henri Martin, Paris 75016, both of France

Division of Ser. No. 295,524, Oct. 6, 1972, Pat. No. 3,805,995.
This application Dec. 20, 1973, Ser. No. 426,653
Int. Cl. B65d 7/42; G01d 13/00
U.S. Cl. 220—69 2 Claims



1. A removable bottom member for fluid holding containers comprising a base member having a cavity for receiving and frictionally engaging the base of a fluid holding container and opposite to said cavity a bottom defined by a first portion in the form of one flat horizontal plane and by a second portion diverging from said plane generally along a line offset from the vertical axis of the container including a counterweight positioned thereon, said line forming a balancing pivot line around which the container pivots by gravity when the level of fluid material in the countainer drops below a preselected minimum amount, whereby the container and bottom member rests on said flat horizontal plane when the fluid therein exceeds said preselected minimum amount and rotates by gravity about said pivot line offset from the vertical axis of the container when the fluid therein falls below said preselected minimum amount.

3,885,699

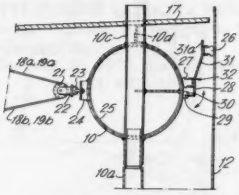
FLOATING ROOF

Nestor Leon Pladys, Rosendael, France, assignor to The British Petroleum Company Limited, London, England

Filed Sept. 20, 1972, Ser. No. 290,761
Claims priority, application France, Sept. 20, 1971, 71.33779
Int. Cl. B65d 87/20
U.S. Cl. 220—225 24 Claims

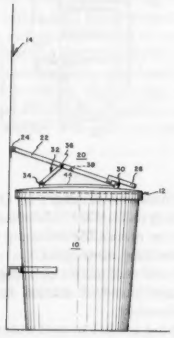
1. A floating roof suitable for use with a large capacity storage tank comprises (i) a central framework and at least

one floating rim, (ii) tensioning cables connected from said central framework to said floating rim, (iii) a covering sheet adapted to be supported by said central framework and said floating rim, and (iv) a seal comprising an articulated collar pivotally attached to the outermost floating rim, said articulated collar being fitted with a first inflatable attachment and



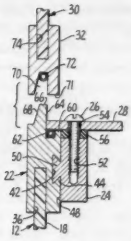
a second inflatable attachment which is nearer to the pivot than the first inflatable attachment, said attachments being on opposite sides of said articulated collar and being adapted so that upon inflation of said inflatable attachments, the second inflatable attachment is pressed against the rim and by a level action presses the first inflatable attachment against a surrounding wall.

3,885,700
CAN TOP REMOVAL MECHANISM
Lavale Allard, Box 171, Haedrige, Nebr. 68949
Filed May 1, 1974, Ser. No. 466,084
Int. Cl. B65d *43/26*
U.S. Cl. 220—263 **7 Claims**



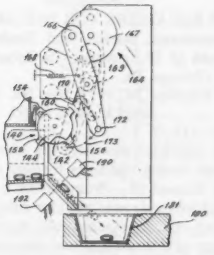
1. An apparatus for removing a can top from a can comprising a fixed pivot means, a first operating lever pivotally connected to said pivot means, a second operating lever pivotally connected to said pivot means, and bell crank means pivotally connected to said first operating lever, said second operating lever and the can top, said pivot connection to said first operating lever being between the ends of said bell crank means, a handle on said first operating lever whereby an upward pivoting movement of said first operating lever removes said can top from one end of said can, and continued upward movement of said first operating lever completely removes said can top from said can.

3,885,701
VALANCE MOLDING FOR EQUIPMENT CASES
Dennis M. Becklin, Grants Pass, Oreg., assignor to Environmental Container Systems, Inc., Palo Alto, Calif.
Filed Oct. 23, 1973, Ser. No. 408,509
Int. Cl. B65d *45/16*
U.S. Cl. 220—325 **7 Claims**



1. A formable valance molding for a case having a mouth bounded by edges of wall panels that form the case, said valance molding comprising an elongate deformable body having a length corresponding to the peripheral length of the mouth, said body having a first surface that defines a continuous slot therein for receiving the edges of the wall panels to secure the valance to the case, said body having a second surface generally normal to said first surface, said second surface facing inward with respect to said mouth, said body defining a continuous channel having a relatively small dimension in said second surface and a relatively large dimension inward of said second surface, portions of said body being excised in a region adjacent said channel to afford access to said channel, a clamp body having a lateral surface adapted to confront said second surface and a protrusion extending from said lateral surface and being configured complementally to said channel so as to be retained therein, said excised region having a longitudinal extent such that said protrusion can be introduced and retained in said channel by inserting said protrusion into said channel at the excised region and sliding the body away from said excised region, said clamp body having means for fastening a mouth spanning panel member thereto.

3,885,702
STORAGE MEANS FOR PELLET DISPENSER
Joel A. Joslin, Crestwood; Alan B. Ranford, Desperes, and Elmer A. Koenig, Kirkwood, all of Mo., assignors to Sherwood Medical Industries, Inc., St. Louis, Mo.
Filed Apr. 3, 1974, Ser. No. 457,678
Int. Cl. B23q *7/00*
U.S. Cl. 221—174 **11 Claims**



1. A pellet storage and dispensing device comprising a storage unit including a bowl adapted to store pellets and

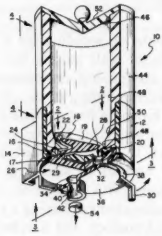
having an outlet for discharging pellets from said bowl, a pair of auxiliary pellet storage bins each adapted to contain an auxiliary supply of pellets for replenishing pellets in said bowl, means mounting each of said bins adjacent said bowl, each of said bins having a hinged closure normally retaining its auxiliary supply of pellets within the bin, and closure operating means including a pair of rotatable wheels each having an abutment member thereon with the abutment members of the wheels in angular relation and respectively engageable with said closures to sequentially open said bins in response to rotation thereof in a given direction.

3,885,703

PILL DISPENSER WITH MOVABLE TRAP CHAMBER AND AGITATOR

William T. Neavin, 3736 Berry Dr., Studio City, Calif. 91604

Filed July 2, 1973, Ser. No. 375,826
Int. Cl. B65d *83/04*
U.S. Cl. 221—202 **13 Claims**



7. A pill dispenser mechanism for dispensing standard sized pills from the open end of an inverted pill container comprising:

a base member having a central upstanding portion registrable within the open end of the pill container and an upper surface defining an eccentric funnel thereon, terminating in a lower discharge orifice, said base member including a lateral aperture in a side of the eccentric funnel portion; pill discharge means including at least one pill receiving orifice, disposed below said base member and movable arcuately between pill receiving and pill discharge positions relative to the discharge orifice; and

pill agitating means mounted on said pill receiving means and extending through the lateral aperture of said base member, and comprising an elongated arm member extending substantially in a lateral plane across the eccentric funnel portion of the base member, and sweeping over the discharge orifice therein during arcuate movement of the pill discharge means.

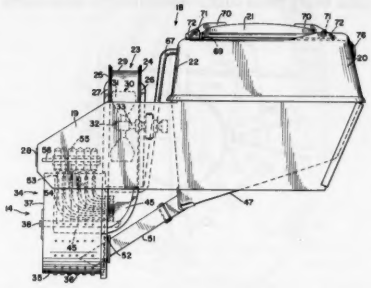
3,885,704

PRESSURE EQUALIZER FOR PNEUMATIC PLANTER

Darlo E. Lienemann, Darien, and Daniel Henry, Downers Groove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 24, 1971, Ser. No. 146,258
Int. Cl. A01c *15/00*
U.S. Cl. 221—211 **3 Claims**

1. A seed dispenser assembly for planters comprising, a stationary wall having openings formed therein; a rotatable seed selector formed of a drum having a closed end and an open end, said rotatable seed selector rotatably mounted such that said open end is adjacent said stationary wall, sealing means between said drum and said stationary wall to prevent escape of air under pressure from the drum; a seed hopper having a top opening, a lid, sealing means between said top opening and said lid to prevent escape of air under pressure from the seed hopper, and a seed discharge outlet connected to the seed selector for delivering seed thereto; an air blower for supplying air under pressure to the interior of the seed selector; said openings connected to said blower and to said hopper respectively to direct air under pressure and seed to



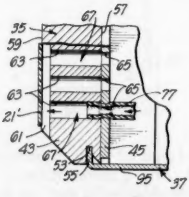
the interior of the drum; and a by-pass opening formed in said stationary wall, said by-pass opening being connected to the hopper to direct air under pressure to the latter for equalizing the air pressure in the hopper with the air pressure in the seed selector to facilitate the flow of seed to the seed selector.

3,885,705

LABEL APPLICATOR WITH RETENTION MEANS FOR FLEXIBLE AIR TUBES

John B. French, Hacienda Heights, Calif., assignor to Compac Corporation, Newark, N.J.

Filed Mar. 12, 1974, Ser. No. 450,314
Int. Cl. C09j *7/02*
U.S. Cl. 221—211 **16 Claims**



1. A label applicator comprising:

wall means defining a chamber, said chamber being adapted for connection to means for reducing the pressure in said chamber to less than atmospheric;

a first portion of said wall means defining a gas pervious wall section, said pervious wall section having an outer face outside said chamber;

means for supplying a label to said outer face of said pervious wall section with the reduced pressure in the chamber releasably retaining the label against said outer face;

a manifold adapted for connection to a source of gas at a pressure greater than atmospheric;

a plurality of flexible tubes;

means for coupling the flexible tubes to said manifold;

said pervious wall section having a plurality of passages;

each of said passages having an outer portion and an inner portion with the inner portion being closer to the interior of said chamber than the outer portion;

each of said tubes being extendible through the inner portion of one of the passages and into the outer portion of such passage, said inner portion gripping the tube which extends therethrough to attach such tube to said pervious wall section, said outer portion exerting a lesser gripping force on said tubes than the inner portion; and

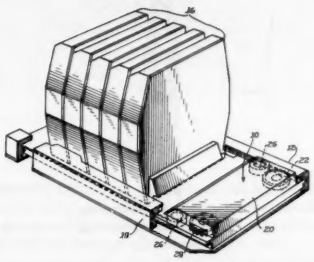
said passages providing communication between the tubes received therein and said outer face whereby the gas under pressure in said manifold can be transmitted through said tubes to blow the label from the outer face of the pervious wall section.

3,885,706

CASSETTE PUSHER VELOCITY REGULATOR

Edward H. Lodge, Wilmette, Ill., assignor to Bell and Howell Company, Chicago, Ill.

Filed Aug. 20, 1973, Ser. No. 389,854
Int. Cl. B65d *83/10*
U.S. Cl. 221—279 13 Claims



1. An apparatus for regulating the motion of an assembly of cassettes during indexing, comprising:

means for applying displacement force to at least one of an assembly of cassettes, the displacement means comprising a pusher assembly and spring means coupled thereto; means for guiding the direction of displacement of the cassettes during movement by said displacement means; the guide means being arranged to opposite sides of said pusher and said cassette assembly, to permit movement thereof only within said guide means;

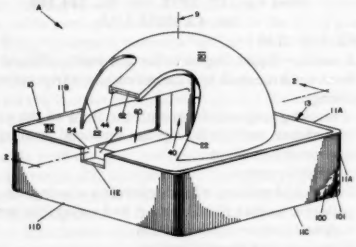
means coupling said spring means to said guide means; and means for regulating the velocity of the cassettes during indexing by modifying the acceleration of said displacement means caused by said spring means, the velocity regulating means comprising gear means attached to both displacement means and guide means.

3,885,707

DISPENSING APPARATUS FOR TOOTHPASTE DENTIFRICE AND OTHER FLOWABLE VISCOUS-MATERIAL

Gladys Ann Wittwer, 725 17th St., Auburn, Nebr. 68305

Filed Sept. 7, 1973, Ser. No. 395,015
Int. Cl. B65d *35/44*
U.S. Cl. 222—96 6 Claims



1. Dispensing apparatus for toothpaste dentifrice and other similarly flowable viscous-material, said dispensing apparatus comprising:

A. A boxy receptacle having an enlarged mouth-opening and including upright wall-means surrounding a vertical-axis for the receptacle and also including a transversely extending base panel means that intersects said receptacle vertical-axis;

B. A dispensible supply of flowable viscous-material enclosed within a manually compressible pouch carried within said boxy receptacle, said dispensible pouch supply including a pouch floor-panel underlyingly supported by the receptacle base panel means and a pouch roof-panel provided with a discharge opening located substantially at the receptacle vertical-axis, the floor-panel and the roof-panel each substantially horizontally and transversely intersecting the vertical-axis and defining therebetween along the pouch vertical-height the pouch volumetric capacity, said pouch along the vertical-axis when enclosing its volumetric capacity of flowable viseous-material being of substantially regular annular cross-sectional size and shape and having the cross-sectional dimension thereof exceeding the pouch vertical-height;

C. Pressure-plate means located externally of said pouch to permit the operator to apply manual pressure vertically against the pouch and toward the receptacle base panel means and thereby cause flowable viscous-material to flowably travel through a conduit means having an exit located above the said dispensible pouch supply;

D. Said conduit means located above the pouch supply and in communicating relationship with the pouch discharge-opening whereby flowable viscous-material might flowably travel through said conduit upon the application of manual pressure by the operator vertically against the pouch through said pressure-plate means, said conduit including a transversely extending upper portion whereby the conduit has a forward side and a forward exit transversely offset from the vertical-axis, the forward side of the conduit and the upper side of said pressure plate means are provided with a grooved track of generally C-shaped configuration; and

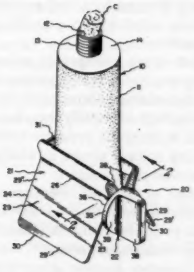
E. Closure means comprising a resiliently movable and flexible tongue slidably disposed along said C-shaped track means for temporarily closing the conduit exit during periods of non-use for the dispensing apparatus.

3,885,708

FLEXIBLE TUBE WINDING AND EMPTYING DEVICE

David W. Parry, 2390 N. Forest Rd., Getzville, N.Y. 14068

Filed June 6, 1974, Ser. No. 476,988
Int. Cl. B65d *35/34*
U.S. Cl. 222—100 12 Claims



1. A device for progressively advancing the contents of a flexible tube longitudinally along a usable portion thereof toward an opening provided through a first end of said tube, and for winding a flattened spent portion of said tube which is arranged proximate a second end thereof, said device comprising:

a pair of opposed jaws arranged to move toward and away from one another and adapted to act transversely upon a part of said tube which is arranged between said jaws, said jaws separating said usable portion from said spent portion;

biasing means including a spring means arranged to engage each of said jaws to continuously urge each of said jaws to move toward the other of said jaws to compressively flatten the part of said tube which is arranged between said jaws; and

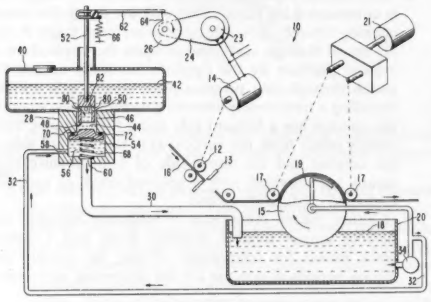
a rotatable turn-key having a shank portion provided with a longitudinal slot adapted to receive said second end of said tube, whereby when said turn-key is rotated said spent portion is wound around said shank portion, said usable portion is drawn between said jaws, and said contents are advanced longitudinally along said usable portion toward said opening.

3,885,709

LIQUID TONER CONCENTRATE DISPENSER HAVING A VALVE RESPONSIVE TO HYDROSTATIC PRESSURE

Raymond L. Levy, Mountain View, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Feb. 1, 1974, Ser. No. 438,917
Int. Cl. B67d 5/46
U.S. Cl. 222—133 **9 Claims**



1. A self cleaning dispenser for dispensing toner concentrate into a developing tank through a flow of toner fluid, comprising the following combination:

a reservoir for containing a quantity of the toner concentrate;

a variable volume chamber in liquid communication with the reservoir formed by a wall member and an end member moveable relative to one another to vary the volume of the chamber;

means for activating changes in volume of said chamber comprising means for reciprocating one of said members causing a decreasing volume stroke in which the chamber members are moved rapidly together causing a temporarily elevated hydrostatic pressure within the chamber, and an increasing volume stroke in which the chamber members are moved slowly apart;

a valve formed in the wall member of the chamber and which opens in response to the temporarily elevated hydrostatic pressure within the chamber during the rapid decreasing volume stroke; and

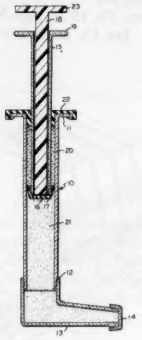
a discharge chamber formed about the valve for receiving the displaced toner concentrate from the variable volume chamber, the discharge chamber having an input port which receives a flow of toner fluid from the developing tank for diluting and agitating the displaced toner concentrate and having an outlet port through which the flow of toning fluid is returned to the developing tank along with the toner concentrate dispensed therein.

3,885,710

MIXING DISPENSER WITH A SELECTIVELY RETRACTABLE SEAL TO PERMIT INTERMIXING OF THE INGREDIENTS

Maxwell L. Cohen, Chevy Chase, Md., assignor to Milton Cohen

Filed Mar. 20, 1973, Ser. No. 343,135
Int. Cl. B67d 5/60
U.S. Cl. 222—145 **15 Claims**



1. A combined mixer and pressure ejector for initially retaining two ingredients in separated relationship, permitting controlled mixing of said components, and controlled ejection of said mixed components comprising:

a hollow barrel,

a plunger reciprocally disposed partially inside said barrel, a deformable seal means radially projecting from said plunger and engageable with the walls of said barrel to provide upper and lower separated chambers within said barrel,

said plunger incorporating manually operable means for enabling the retraction of said seal means away from the walls while the plunger is stationary within the barrel and said plunger and seal means being constructed and arranged to provide positive mixing of said components by the seal means by reciprocating said plunger with the seal means in retracted position,

said manually operated means permitting return of the said means to the walls for enabling the ejection of said mixture.

3,885,711

SANITARY LIQUID DISPENSER

Charles P. Martindale, 4322 Palm Tree Blvd., Cape Coral, Fla. 33904

Filed Apr. 17, 1972, Ser. No. 244,358
Int. Cl. B67d 5/62
U.S. Cl. 222—146 **9 Claims**

1. A sanitary liquid dispenser for dispensing a liquid such as milk from a source such as a cannister in a refrigeration closet comprising:

A. a housing suspended beneath the floor of the refrigeration closet and including an enclosed semi-spherical lower end providing,

1. a fixed portion,

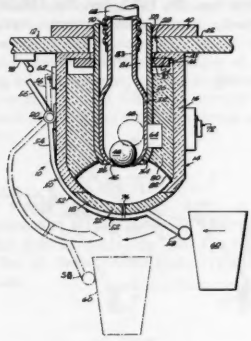
2. a central portion which comprises a swingable portion hinged to said fixed portion and swingable between a closed and an open position,

3. an enclosed inner chamber;

B. a well, extending upwardly through the floor of the refrigeration closet and downwardly into said chamber and having an inwardly rounded bottom flange,

C. a tubular insert including an inwardly rounded bottom flange seated on said well flange providing an opening defining a valve seat for a ball valve comprising said valve means nested within said well providing,

1. an open upper end,



2. a normally closed valve means at the lower end;

D. a conduit tube extending in open communication between the liquid storage source in the refrigeration closet and said insert through said open upper end;

E. means to open said valve means, when said swingable portion is swung from a closed position to a fully open position to permit a fluid flow from the source through said open valve.

3,885,712

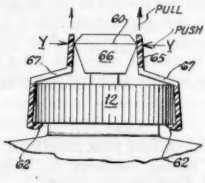
CHILDPROOF CLOSURES OF THE PULL-PUSH TYPE

Sidney M. Libit, 441 Lakeside Terrace, Glencoe, Ill. 60022

Filed June 28, 1974, Ser. No. 484,284

Int. Cl. B67d *5/32*

U.S. Cl. 222—153 **12 Claims**



3. In combination, a dispensing closure of the pull-push type for a container for a hazardous substance potentially injurious to small children and an adjunct to preclude opening of the closure by a child of tender years, the closure comprising a fixed part having means attaching the same to the container and a movable part operatively mounted on the fixed part for reciprocating movement between "on" and "off" positions for flow of contents from the container and termination of flow respectively, the fixed part having a passage in fluid communication with the interior of the container and the movable part having a passage for exit of the substance from the container, a valve intermediate said passages which, upon movement of the movable part to "on" position connects the passages for flow therethrough, the movable part having an actuating head and a stem extending therefrom into the fixed part to constitute the movable part of the valve, the adjunct having first means for attachment of the adjunct to the fixed part and second means cooperative with the head of the movable part of the closure for joint movement therewith, said second means including guard means normally preventing access to the head for actuation of the valve, said guard means comprising a sleeve of resilient but generally shape-retaining material around the head capable of being digitally squeezed against the head to couple said guard and head to open the valve.

3,885,713

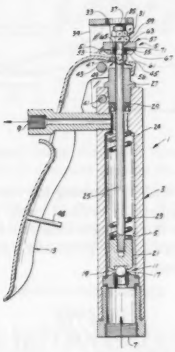
DISPENSING GUN WITH SAFETY RING

George Weitzel, Bridgeton, Mo., and Wayne J. Devries, Mount Olive, Ill., assignors to McNeil Corporation, Akron, Ohio

Filed Dec. 10, 1973, Ser. No. 423,133

Int. Cl. F16r *3/12*

U.S. Cl. 222—153 **4 Claims**



1. A gun for dispensing a viscous composition, such as lubricating grease, automotive undercoating compounds or the like, comprising a body, a bore within said body, an inlet for said bore adapted for connection to a source of pressurized composition to be dispensed, an outlet for the bore adapted for discharge of said pressurized composition from said bore, and valve means for controlling the flow of said composition under pressure from said inlet to said outlet, said valve means comprising a valve seat in the bore, a valve member movable toward and away from the seat, a rod extending from the valve member out of one end of the bore, spring means biasing the valve member toward the seat to close said valve means, a handle pivotally mounted on the body, the rod extending through an end portion of the handle, an abutment on the rod outward of said end portion of the handle, and compression link means between said end portion of the handle and said abutment, said compression link means comprising a member adjustable on the rod between an operative position wherein said link means constitutes a compression link between said end portion of the handle and said abutment to transmit motion from said end portion of the handle to the rod to move said valve member away from said seat when the handle is swung to open said valve means, and a safety position permitting lost motion of said end portion of the handle relative to said abutment.

3,885,714

SYSTEM FOR COUPLING PUMP UNITS TO OUTLETS UNDER WATER

Evert Sjostrand, Solna, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

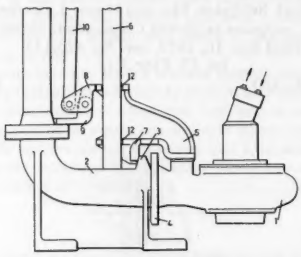
Filed Apr. 19, 1974, Ser. No. 462,413

Int. Cl. F04b *17/00*

U.S. Cl. 222—180 **6 Claims**

1. A locking device for submersible pumps arranged as a releasable connection between a pump unit and a usually submerged outlet pipe, comprising guide means attached to a pump unit, said guide means including spaced upper and

lower sleeve adapted to slide along a substantially vertical guide when a pump unit is being lowered or raised, a locking pawl, means for operating said locking pawl from a position above a water surface when said pump unit is submerged, said locking pawl including means engaging said upper sleeve for



securing the pump unit by pressing the upper sleeve against one side of the substantially vertical guide while pressing the lower sleeve against the opposite side of the vertical guide to rotate the guide means and press the pump unit securely against the outlet pipe.

3,885,715

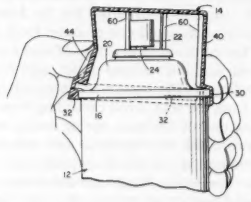
SECURITY CAPS FOR CONTAINERS

Robert D. Lowry, Winchester, Mass., assignor to Lowry Development Corporation, Winchester, Mass.

Continuation-in-part of Ser. No. 284,660, Aug. 29, 1972, abandoned. This application Aug. 6, 1973, Ser. No. 386,017

Int. Cl. B65d *55/02*

U.S. Cl. 222—182 **10 Claims**



1. A cap for an aerosol container having a bead around its top outer periphery comprising

a hollow cap including

a bottom skirt depending from a superimposed body portion,

a plurality of inwardly-extending spaced lugs on said skirt for engaging the bead on said container

one of said lugs being disposed at the front of said cap, the lower portion of the front wall of said cap above said front lug having one or more vertical stiffening ribs extending upwardly from said skirt to a point spaced downwardly from the top of the cap, said ribs being on the outside of said front wall, the upper portion of said cap above said stiffer portion being more flexible than said stiffer portion and adapted to be deformed when inward pressure is exerted against said upper portion to distort said skirt to move said front lug radially outwardly,

said cap being removable backwardly and upwardly off said container after said front lug has been so moved outwardly, followed by exertion of upward pressure on said front wall to raise said front lug free and clear of said container bead.

3,885,716

APPLIANCE TO MEASURE OUT A GIVEN VOLUME OF POWDER

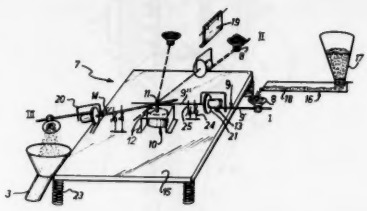
Claude Marechal, Lozanne, France, assignor to Ciments Lafarge S.A., Paris, France

Filed Nov. 29, 1972, Ser. No. 310,367

Claims priority, application France, Apr. 25, 1972, 72.14569

Int. Cl. G01f *11/10*

U.S. Cl. 222—346 **3 Claims**



1. A device for measuring out at a filling station successive samples of a powderous substance from a bulk quantity thereof and for delivering said samples at a delivery station located at a distance from said filling station, comprising: a substantially horizontal arm having first and second portions; a calibrated open-ended receptacle mounted on said first portion of said arm; a rotary joint connecting said first arm portion to said second arm portion and permitting rotation of said first arm portion between a first position wherein the open end of said receptacle is upwardly directed and a second position wherein the open end of said receptacle is downwardly directed; a substantially vertical rotary shaft connected to said second portion of said horizontal arm for rotating said arm, a motor driving said vertical shaft for rotating said arm and said receptacle between said filling and delivery stations, means for biasing said first arm portion to said first position, means at said delivery station engageable with said rotary joint for rotating said first arm portion to said second position when said arm is at said delivery station, means for delivering an amount of said powderous substance from said bulk quantity thereof into said receptable when the latter is at said filling station, and means for vibrating said receptacle.

3,885,717

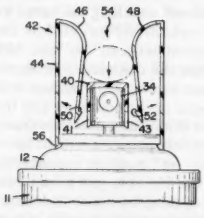
CHILD SAFETY CLOSURE FOR AEROSOL CONTAINERS

Ronald F. Ewald, Rolling Meadows, Ill., assignor to Seaquist Valve Company, Cary, Ill.

Continuation-in-part of Ser. No. 281,917, Aug. 18, 1972, Pat. No. 3,786,968. This application Apr. 19, 1973, Ser. No. 352,440

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.11 **10 Claims**



1. A safety adaptor for an aerosol dispenser comprising control means to prevent actuation of a valve actuating means by a finger less than a predetermined width, said control means comprisng a base attached tp said aerosol dispenser,

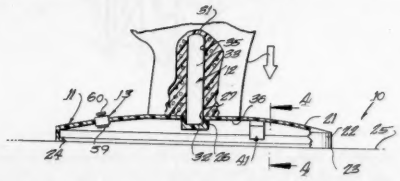
said base including at least one pair of finger guides attached thereto by resilient interconnecting means, said resilient interconnecting means disposed to movably bias said finger guides in predetermined spaced relation to one another, at least one of said finger guides including a locking means disposed thereon to operatively engage an element of said aerosol dispenser to prevent actuation of said dispenser when in a locked position, said finger guides being movable away from one another and against the biasing portion of said resilient interconnecting means, whereby said locking means is moved out of operative engagement with said aerosol dispenser to permit movement of said valve actuation means and actuation of the dispenser.

3,885,718

PORTABLE WIG STAND

John A. Clemence, 501 Halsey Ave., San Jose, Calif. 95128

Filed July 22, 1974, Ser. No. 476,827
Int. Cl. D06c *15/00;* **H45c** *11/02*
U.S. Cl. 223—66 **5 Claims**



1. A portable wig stand adapted to support a head shaped manikin thereon for purposes of maintaining and styling a wig supported on the manikin, the wig stand comprising:
- a base member adapted to be rested on a horizontal supporting surface;
- a post adapted to be removably secured in an operative position in said base and project upright therefrom and adapted to be received in a base of said manikin to secure the same to the stand;
- a resilient spring clip affixed to said base and adapted to hold said post when in an inoperative position separated from said base;
- vacuum means associated with said base and selectively operable in a manner to assist in securing said base to said supporting surface; and
- valve means mounted in said base and in communication with said vacuum means and movable between an inoperable position retaining said vacuum and an operative position destroying said vacuum and permitting said base to be easily removed from said supporting surface.

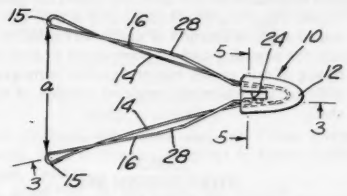
3,885,719

DEVICE FOR THREADING A RIBBON THROUGH A HEM

Penelope Williams, 3364 Nevada Ave., Costa Mesa, Calif. 92626

Filed Feb. 19, 1974, Ser. No. 443,225
Int. Cl. D04d *11/00*
U.S. Cl. 223—103 **4 Claims**

1. A lacing device for threading a ribbon through a tunnel, comprising:
- a smooth pilot body dimensioned to pass through the tunnel;
- a pair of resilient wires attached to said pilot body and extending rearwardly therefrom;
- said wires being doubled back from their outer ends towards the pilot body, forming a pair of resilient two-wire arms with loops at the outer ends thereof, respectively, which are adapted to engage the ribbon material, the forward ends of said doubled-back wires extending forwardly beyond the trailing edge of the pilot body, and said forward ends being pointed to penetrate the material of the ribbon; and
- said pilot body having a cavity provided therein into which said forward ends of said wires can be inserted by springing the doubled-back ends of the wires toward the cavity, said forward ends of the wires being engaged and retained by spring tension in said cavity so as to shield the points thereof;



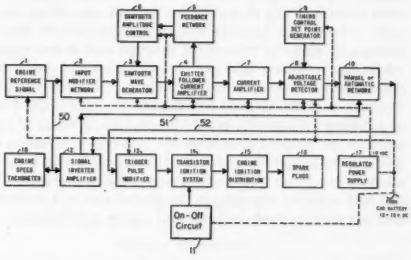
- said two-wire arms being resiliently biased to spread said two loops apart a distance greater than the width of the ribbon when unrestrained, whereby engaging said loops with the leading end of the ribbon at transversely spaced points thereon causes the arms to place the leading end of the ribbon under transverse tension to hold the ribbon flat.

3,885,720

METHOD AND SYSTEM FOR CONTROLLING COMBUSTION TIMING OF AN INTERNAL COMBUSTION ENGINE

William R. Brennan, Stanford, Conn., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 109,878, Jan. 26, 1971. This application Jan. 10, 1973, Ser. No. 322,393
Int. Cl. F02p *5/04*
U.S. Cl. 123—148 E **14 Claims**



1. A system for controlling the timing of the combustion cycle in an internal combustion engine having a rotatable power shaft, said system comprising:
- means responsive to rotation of said power shaft for generating sequential input trigger signals having a frequency proportional to the speed of rotation of said power shaft;
- a waveform generator responsive to said input trigger signals for generating sequential sawtooth waveforms, each of said sawtooth waveforms having a duration corresponding to a predetermined number of degrees of power shaft rotation and having an amplitude changing as a function of time;
- feedback means responsive to said waveform generator for maintaining the maximum amplitude of said sawtooth waveforms at a substantially constant level for all engine speeds by varying the rate of change of the amplitude as a function of engine speed such that a given instantaneous

magnitude of each sawtooth waveform corresponds to a predetermined angular position of the power shaft regardless of engine speed;

means for generating a set point signal corresponding to a predetermined angle of rotation of said power shaft;

means for detecting when the amplitude of each of said sawtooth waveforms reaches a level defined by said set point signal so as to correspond to a predetermined angle of rotation of said power shaft;

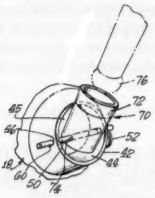
means responsive to said detecting means for generating an engine trigger signal corresponding in time to a predetermined angle of rotation of said power shaft; and

means for adjusting said set point signal so as to adjust the timing of said engine trigger signal to correspond with a different predetermined angle of rotation of said power shaft.

3,885,721
SPORT FISHING BELT

Anthony M. Vanus, 105 Bronn Dr., Claremont, Calif. 91711

Filed Nov. 30, 1973, Ser. No. 420,449
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 E **1 Claim**



1. A sport fishing belt comprising a rod holding plate fixed to a belt, the belt being adapted to be secured about the body of the user, the plate having secured thereto a generally cup shaped holder bracket for the fishing rod, the bracket having a pair of diametrically opposed circular holes, a pin having its ends slidably fitting in said holes, said pin extending diametrically across said bracket and being removable from said bracket by endwise movement through said holes, means for releasably retaining said pin in said holes and a cup having diametrically opposed holes slidably receiving said pin, whereby said holder may be adapted to receive the butt end of a fishing rod directly in said bracket by removal of said pin and cup, or adapted to receive the butt end of a fishing rod in said cup by installation of said pin and cup in said bracket, or adapted to receive a slotted gimbal on the butt end of a fishing rod with said pin engaging in the gimbal slot by installation of said pin only or both said pin and cup in said bracket.

3,885,722
PACK FRAME SUSPENSION MEANS

Jerry D. Robertson, Phoenix, Ariz., assignor to Camp Trails Company, Racine, Wis.

Filed May 8, 1972, Ser. No. 251,054
Int. Cl. A45f *3/00*
U.S. Cl. 224—25 A **15 Claims**

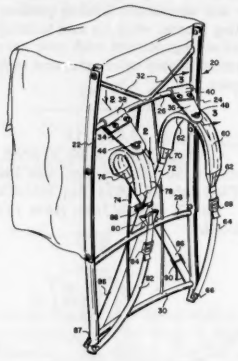
14. A pack frame suspension means comprising:

a rigid frame having, when in worn position, top and bottom ends and opposite sides;

a sway adjustment ring secured to said frame between said top and bottom ends and between said opposite sides;

flexible shoulder straps adjacent to said frame between said top and bottom ends and said opposite sides, said straps including concavo-convex shoulder-engaging portions between said top end and said sway adjustment ring, said shoulder straps having first ends attached near said bottom end of said frame and second ends joined together through said sway adjustment ring thereby permitting self-adjustment of the relative lengths of the shoulder straps during certain body movements;

substantially rigid brace members coupled to said frame near said top end, extending from said frame, and terminating in free ends generally aligned with said shoulder-engaging portions of said shoulder straps, said brace



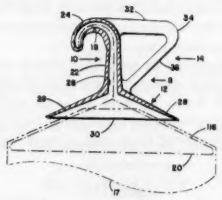
members being of substantially fixed dimensions between said couplings to said frame and said free ends, said brace members further being of resilient material deflectable in up and down directions; and

means connecting said free ends of said brace members with the convex surfaces of said shoulder-engaging portions of said straps.

3,885,723
CARRIER DEVICE FOR HANGER SUPPORTED GARMENTS

Robert L. Magnie, 945 Detroit St., Denver, Colo. 80206

Filed Jan. 14, 1974, Ser. No. 432,963
Int. Cl. B65d *35/28*
U.S. Cl. 224—45 T **11 Claims**



1. A carrier device for hanger supported garments wherein the hanger has an upper hook shaped portion and a depending body portion comprising,

a skirt adapted to extend at least partially over the body portion of the hanger, said skirt having an opening therethrough,

a connection element integrally connected to the skirt and extending upwardly from the skirt from a location immediately adjacent said opening in the skirt, said connection element having means for confining the hook shaped portion of the hanger so that the connection element conforms in configuration to that of the hook shaped portion of the hanger, and

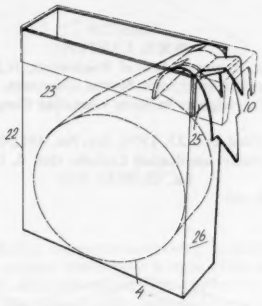
a handle connected to the connection element adapted to be grasped by a user in carrying the hanger and the garments supported thereby.

3,885,724

DEVICE FOR TEARING OFF PIECES OF A CERTAIN LENGTH FROM A STRIP

Åke Ehrlund, Alvkvarnsvagen 177, Spanga, Sweden

Filed Jan. 24, 1973, Ser. No. 326,457
Claims priority, application Sweden, Jan. 26, 1972, 846/72
Int. Cl. B26f *3/02*
U.S. Cl. 225—77 **5 Claims**



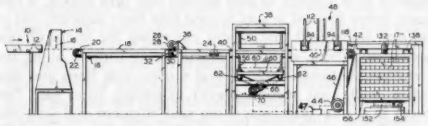
1. A device for tearing off pieces of the same predetermined length from a roll of fed flexible strip, said strip having punched lines forming tongues equally spaced along said strip with their spacing equal to said predetermined length and directed in the feeding direction for said strip, whereby the portion of each tongue which is firmly connected to the remainder of the strip is perpendicular to the longitudinal direction of the strip, said device comprising a casing for said strip roll, said casing having side walls and an open top, a cover pivotally connected to said casing and closing said top, said cover having an outwardly extending portion, another portion integral with the first-mentioned portion and extending in a downwardly direction relatively to the cover, said casing having a portion extending substantially parallel to the first-mentioned portion but spaced therefrom to form a gap for the passage of the strip out of the casing, a flange for temporarily arresting movement of said tongue integral with the third-mentioned portion and extending close to the second-mentioned portion but spaced therefrom to form a gap for the continuing passage of the remainder of the strip, and tear-off portions on either side of said flange connecting the base of said flange to the side walls of the casing arranged for the cut-off of the remainder of the strip.

3,885,725

MACHINE FOR MANUFACTURING ARTICLES OF FOLDED PLASTERBOARD

James P. Petermann, Tigard; William E. Dolinar, and Stanley V. Ehrlich, both of Portland, all of Oreg., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Apr. 10, 1974, Ser. No. 459,674
Int. Cl. B27f *7/14*
U.S. Cl. 227—66 **6 Claims**



1. A machine for manufacturing articles of folded plasterboard, comprising:

cutter means for cutting plasterboards to a standard length;

scoring means for scoring said boards on the opposite sides thereof to provide a plurality of spaced score lines extending partially through the thickness of said boards;

folding means for folding each of said boards along said score lines to provide a folded member having a plurality of pleats formed by layers of gypsum board material

fastening means for fastening together the layers of each folded member to form said articles; and

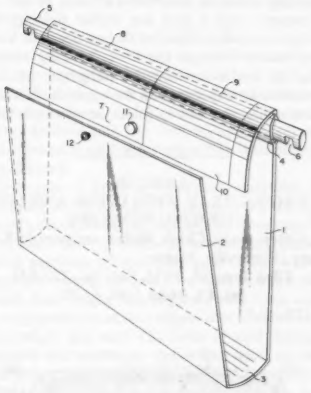
automatic conveyor means for intermittently conveying said boards between said cutter means, said scoring means, said folding means and said fastening means.

3,885,726

OFFICE FOLDER

Karl Gösta Fridlund, Stockholm, and Jan Urban Jiveman, Jakobsberg, both of Sweden, assignors to Gosta Fridlund, Stockholm, Sweden

Filed Feb. 20, 1973, Ser. No. 333,459
Claims priority, application Sweden, Feb. 17, 1972, 1888/72
Int. Cl. B65d *3/00*
U.S. Cl. 229—1.5 R **1 Claim**



1. A folder for letters, documents, and the like, comprising, in combination:

a. a first section, a second section, and a bottom section, the latter being arranged interconnecting the first and second sections at one edge of each;

b. a longitudinal track arranged at another edge of the first section, which another edge is opposite the one edge connected to the bottom section and is parallel to the bottom section;

c. a mounting bar free-running insertable in the track;

d. a longitudinal overlapping section being arranged in connection with the another edge of the first section and provided with at least one pocket arranged for the insertion of marking labels, and with a first locking member at the inner surface of the overlapping section; and

e. a second locking member arranged on the outside of the second section for cooperating with the first locking member and creating a locked closing of the folder in hanging as well as lying position thereof.

3,885,727

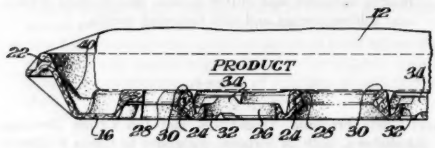
PACKAGING TRAY WITH JUICE TRAPPING VIEWING WINDOWS

James E. Gilley, South China, Maine, assignor to Keyes Fibre Company, Waterville, Maine

Filed Apr. 18, 1974, Ser. No. 462,097The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl. B65d *1/00*

U.S. Cl. 229—2.5 **5 Claims**



1. A molded, open top tray for packaging products, such as moist pieces of meat, fish or poultry in conjunction with a transparent wrapping enclosing both the tray and the product packaged thereon, comprising a base portion defining the bottom of the tray, a plurality of truncated hollow posts tapering upwardly from the base portion, the upper ends of said posts having openings which define viewing windows, the periphery of said windows providing product support rims, openings through the base portion between the posts to define lower viewing windows whereby portions of the packaged product located over a post are visible through the upper viewing windows and portions of the product not located over a post are visible through the lower viewing windows, and upstanding lip means around the periphery of each lower viewing window to trap juices on the upper surface of the base portion and inhibit the flow of juices downwardly through the lower viewing windows.

3,885,728

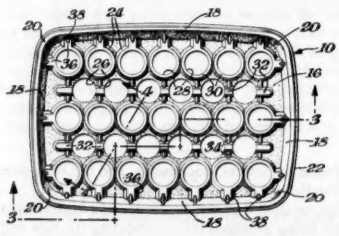
PACKAGING TRAY WITH UPPER AND LOWER VIEWING WINDOWS

James E. Gilley, South China, Maine, assignor to Keyes Fibre Company, Waterville, Maine

Filed June 25, 1973, Ser. No. 373,432

Int. Cl. B65d *1/00, 65/00*

U.S. Cl. 229—2.5 **8 Claims**



1. A molded, open top tray for packaging products, such as moist pieces of meat, fish or poultry in conjunction with a transparent wrapping enclosing both the tray and the product packaged thereon, comprising a base portion defining the bottom of the tray, a plurality of truncated hollow posts tapering upwardly from the base portion, the upper ends of said posts having openings which define viewing windows, the periphery of said windows providing product support rims, openings through the base portion between the posts to define lower viewing windows whereby portions of the packaged product located over a post are visible through the upper viewing windows and portions of the product not located over a post are visible through the lower viewing windows, the size of the upper viewing windows as defined by the product support rims and the spacing of the upper viewing windows with respect to each other precluding substantial contact between the packaged product and the base portion of the tray, and the horizontal dimensions of the upper viewing windows being greater than the vertical distance between the level of the upper viewing windows and the level of the lower viewing windows.

3,885,729

BOOK CARTON

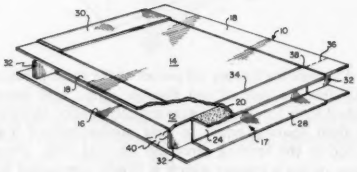
Arthur Rous, deceased, late of Englewood, N.J. (by Vivian Rous); David Cowen, and Myron Eisenstein, both of New York, N.Y., assignors to Stone Container Corporation, Chicago, Ill.

Filed Jan. 23, 1974, Ser. No. 435,704

Claims priority, application Canada, Oct. 4, 1972, 153250

Int. Cl. B65d *5/02*

U.S. Cl. 229—40 **5 Claims**

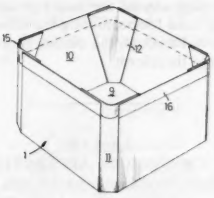


1. A carton comprising an integral one-piece blank including a top wall and bottom wall, said top and bottom walls being parallely aligned one above the other, first side flaps being hingedly connected to the sides of said top wall, second side flaps being hingedly connected to the sides of said bottom wall, first and second end walls which adjoin the ends of said top and bottom walls, said first end wall including a first panel being completely glued to the inwardly facing surface of said top wall and being parallely aligned with said top wall, a second panel being hingedly connected to said first panel and being perpendicularly disposed with respect to said top wall and a third panel being hingedly connected to said second panel and being hingedly connected to said bottom wall; said second end wall including a fourth panel being completely glued to the inwardly facing surface of said bottom wall and parallely aligned with said bottom wall, a fifth panel being hingedly connected to said fourth panel and being perpendicularly disposed with respect to said bottom wall, and a sixth panel being hingedly connected to said fifth panel and being hingedly connected to said top wall and a pair of end flaps being hingedly connected to the ends of said second and fifth panels, said end flaps being adapted to be perpendicularly disposed with respect to said second and fifth panels, a first precut being formed in said second side flaps adjacent one of said end walls, said first precut extending the width of said second side flaps, a second precut being formed along the boundaries between each of said second side flaps and said bottom wall, said second precut extending from said first precut in a direction away from said adjacent end wall and means for separating said top wall into two sections, said separating means extending across the width of said top wall and said first side flaps, said separating means being positioned generally parallel to and adjacent said adjacent end wall.

3,885,730
STERILIZABLE PACKAGE

Od W. Christensson, Stockholm, Sweden, assignor to Christenssons Maskiner & Patenter Aktiebolag, Bromma, Sweden

Filed Mar. 7, 1974, Ser. No. 448,941
Int. Cl. B65d 5/64
U.S. Cl. 229—43 9 Claims

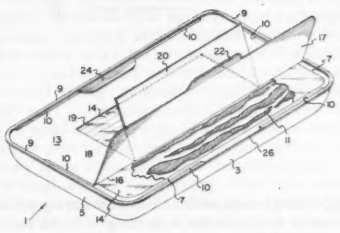


1. A sterilizable container comprising a container bowl of a liquid-tight material which bowl is open at the top and which is connected along the upper edge thereof to a lid thereby forming a tight, closed unit, characterized in that said container bowl is formed by at least two thin foils which are intimately contacting a base of a stiff material disposed therebetween wherein said base extends a distance less than the distance to said upper edge of said container bowl, and wherein said foils are joined together along said upper edge and said lid is joined in sealed relationship with the non-strengthened upper part of said container bowl.

3,885,731
PACKAGE CONSTRUCTION

Charles D. Mullinix, 465 Golden Rd., Fallbrook, Calif. 92028

Filed Sept. 30, 1971, Ser. No. 185,190
Int. Cl. B65d 43/10
U.S. Cl. 229—43 5 Claims

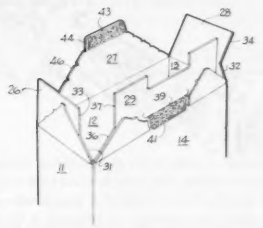


1. A cover construction for a food package or the like comprising a transparent membrane; an opaque panel having opposite sides and ends overlying said membrane, said panel having between its sides a score line adjacent one side thereof and extending from one end to the opposite end to form a hinged edge portion between said score line and said one side of said panel, said hinged edge portion being swingable about said score line, said panel having a first slit between its opposite ends and extending along a line located between said score line and the opposite side of said panel and substantially parallel to but spaced from said score line, said panel also having slits at opposite ends of said first slit and extending to said score line to form a hinged flap swingable about said score line; and means adhering said panel to said membrane at selected zones to permit swinging movement of said hinged edge portion and of said flap relative to said membrane.

3,885,732
CARTON WITH EASY OPENING RECLOSURE

Thomas W. Foster, Palo Alto, Calif., assignor to Fiberboard Corporation, San Francisco, Calif.

Filed Mar. 27, 1974, Ser. No. 455,181
Int. Cl. B65d 5/54
U.S. Cl. 229—51 TC 9 Claims



1. A carton structure having an easy opening feature, said carton structure comprising side walls, a front wall, a back wall, a bottom closure and a top closure, said top closure comprising

a. minor flaps hinged to said side walls,
b. an inner major flap hinged to said front wall,
c. an outer major flap hinged to said back wall, said outer major flap folded over and sealed to said other flaps only in areas closely adjacent its side edges and a front edge thereof to form said top closure,
d. a tab formed in said outer major flap medially of the front edge thereof,
e. a first pair of lines of weakness extending diagonally outwardly and backwardly from said tab toward the corners of said outer major flap remote from said front edge,
f. a second pair of lines of weakness extending from medial portions of said first pair of lines of weakness diagonally outwardly and forwardly towards the corners of said outer major flap adjacent said front edge, and
g. cutaway portions at side edges of at least one of (1) said inner major flap and (2) both of said minor flaps, so arranged that said outer major flap is sealed only to said inner major flap in areas adjacent its front edge and only to said minor flaps in areas adjacent its side edges, whereby said closure may be opened by first grasping said tab and pulling upwardly to split said outer major flap along said first pair of lines of weakness and then grasping said inner major flap and pulling upwardly to split the remaining sealed portions of said outer major flap along said second pair of lines of weakness.

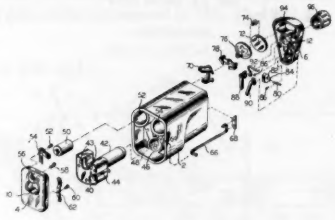
3,885,733
NEW ELECTRIC PROD

Franklin R. Klebold, P.O. Box 7650, and Robert L. Bruce, 1604 Eagle Drive, both of Fort Worth, Tex. 76111

Filed Mar. 27, 1973, Ser. No. 345,462
Int. Cl. B68b 11/00
U.S. Cl. 231—2 E 16 Claims

1. An electrical prod for animals or individuals; comprising, an elongated body member of non-conducting material; a battery means; shocker circuit means operatively connected to said battery means and including a pair of spaced spark gap means; acoustical signal circuit means operatively connected to said battery means; and switch means operatively connected to said shocker circuit means and said acoustical signal circuit means and adapted to independently actuate one of said acoustical signal circuit means and a combination of said

acoustical signal circuit means and said shocker circuit means; said battery means, said shocker circuit means, said acoustical signal circuit means and said switch means being mounted on said body member.



3,885,734

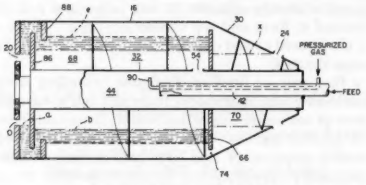
CENTRIFUGE APPARATUS

Chie-Ying Lee, Hatboro, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 284,371, Sept. 6, 1972, Pat. No. 3,795,361. This application Jan. 10, 1974, Ser. No. 432,258

Int. Cl. B04b 1/20

U.S. Cl. 233—3 6 Claims



1. In a decanter centrifuge for separating light and heavy phase materials into respective inner and outer layers from a mixture thereof and for separately discharging said materials, having an elongated imperforate bowl with a tapered portion, said bowl being adapted for rotation about its longitudinal axis, feed means for delivering the mixture to be separated into said bowl, a screw conveyor coaxially arranged with the bowl to revolve relative to the bowl for advancing heavy phase material in the direction of the tapered portion of the bowl, means for discharging light phase material from the bowl, and means for discharging heavy phase material from the bowl including a discharge port in the tapered portion of said bowl, said discharge port having a weir surface, that improvement comprising:

a baffle positioned between said axis and said bowl and dividing the interior of the bowl into

a separating zone which communicates with said means for discharging light phase material, and

a discharging zone for heavy phase material which is disposed within the tapered portion of the bowl and communicates with said means for discharging heavy phase material,

said baffle having its inner edge disposed closer to said axis than the radial distance between said weir surface and said axis, and extending through the entire layer of separated light phase material in the separating zone and having its outer edge closely spaced from the bowl to define therewith a restricted passageway for the underflow of heavy phase material from the separating zone to the discharging zone and to prevent the flow of separated light phase material from said separating zone to said discharging zone,

and means for pressurizing the heavy phase material in the separating zone beyond the pressures applied thereto by the centrifugal force of separated light phase material disposed radially outwardly of the weir surface of said port, whereby the additional pressure provided by said pressurizing means is transmitted to the heavy phase material in said separating zone and through said restricted passageway to the heavy phase material in the discharging zone for promoting the advance of the heavy phase material through the discharging zone to said port for discharge thereform.

3,885,735

CENTRIFUGE APPARATUS

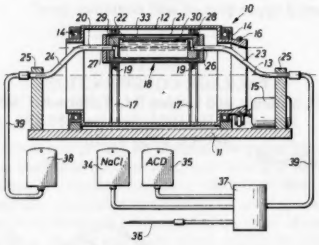
J. Eric H. Westbert, Rodstuguvagen 14, 181 31 Lidingo, Sweden

Filed Aug. 27, 1973, Ser. No. 391,537

Claims priority, application Sweden, Nov. 2, 1972, 14193/72

Int. Cl. B04b 5/00

U.S. Cl. 233—25 14 Claims



1. Apparatus for use with a centrifuge having a rotor rotatable about a first axis for separating a liquid mixture into fractions of different densities, comprising:

a. a jacket;

b. bearing means, adapted to be mounted on the centrifuge rotor remotely from said first axis, for supporting said jacket for relative rotation with respect to the rotor about a second axis;

c. flexible inlet and outlet conduits for liquid connected at one end to said jacket;

d. an elongated flexible holder adapted at one end remote from the rotor to be held stationary by a fixed reference, and connected to said jacket for holding it against rotation about said second axis;

e. a separation vessel disposed in and rotatably supported by said jacket for relative rotation about said second axis and communicating with said conduit; and

f. orientation means acting on said vessel for maintaining it in a fixed angular position about said second axis during rotor rotation.

3,885,736

HOT WATER CONTROLLING DEVICE

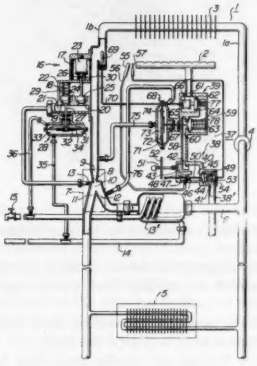
Keizo Amagami, Neyagawa; Yutaka Takahashi, Suita; Motoyuki Nawa, Amagasaki; Norio Kawabata, Yamatokoriyama; Nobuhiko Nishibayashi, Nara, and Katsumi Sasada, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 163,608, July 19, 1971. This application Jan. 28, 1974, Ser. No. 436,929

Claims priority, application Japan, July 23, 1970, 45-65294; July 23, 1970, 45-65297; July 23, 1970, 45-65304

Int. Cl. G05b *11/44*; F24d *3/08*

U.S. Cl. 237—8 R 5 Claims



1. A hot water control device comprising a burner; a hot water circulating passage having a radiator, a first heat exchanger which is heated by the burner, a forward passage connecting one end of said heat exchanger with one end of said radiator, a backward passage connecting the other end of said first heat exchanger with the other end of said radiator, and a circulation pump in the mid-portion of the circulating passage; a bypass passage connected between said forward passage and said backward passage for forming a short hot water circulating circuit near said first heat exchanger, said bypass passage including said circulation pump; a first fluid device disposed in said forward passage, said first fluid device including an annular supply port connected with the upstream of said forward passage, an annular nozzle formed adjacent to said supply port, an annular interaction region, first and second output ports which diverge from said nozzle as an inner and an outer port through said interaction region, said first output port being connected with the downstream of said forward passage and said second output port being connected with said bypass passage, and a control passage connected to said interaction region for providing control water to said interaction region; a control device for said first fluid device for detecting the temperature of the water in said forward passage and opening and closing said control passage of said first fluid device depending on the water temperature; a hot water supply circuit including a second heat exchanger for providing hot water in the hot water supply circuit, said second heat exchanger being connected to said bypass passage; a water pressure responsive device which operates according to the water pressure difference between the upstream and the downstream of the hot water supply circuit, said control device including a heat responsive means responsive to the temperature variation of the water in said forward passage, said water pressure responsive device including means, in parallel with said heat responsive means, for opening and closing said control passage; and a control port connected with said control passage, said control port being formed on the whole portion of one of said output ports in said interaction region.

3,885,737

DISPENSING PACKAGE, CARTRIDGE AND CONTAINER

Lucius D. Watkins, Hartland, Wis., assignor to Permtek, Incorporated, Naples, Fla.

Continuation-in-part of Ser. No. 169,439, Aug. 5, 1971, Pat. No. 3,785,556, which is a continuation-in-part of Ser. No. 854,979, Sept. 3, 1969, Pat. No. 3,661,506. This application Oct. 23, 1973, Ser. No. 408,479

Int. Cl. A47g *21/18*; A61j *15/80*

U.S. Cl. 239—34 17 Claims

1. A package for controllably dispensing a liquid substance and including first and second plies of a plastic material which is permeable to the liquid substance, each of said plies being formed to include a plurality of corrugations with said corrugations of one of said plies being substantially identical to the corrugations of the other of said plies, said first and second plies being peripherally sealed to each other and in opposed relation to form a sealed package with said corrugations of one of said opposed plies in nested relation to said corrugations of the other of said opposed plies, and a quantity of said liquid substance in said sealed package.

3,885,738

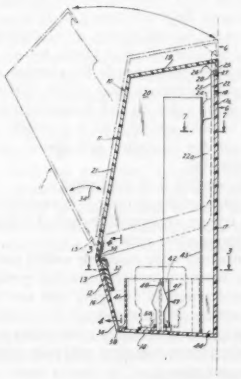
VOLATILIZING DISPENSER

David M. Chesmel, Marlboro, N.J., and I. Martin Spier, New York, N.Y., assignors to West Chemical Products, Incorporated, Long Island, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,401

Int. Cl. A61l *9/04*

U.S. Cl. 239—44 13 Claims



1. A volatilizing dispenser comprising closely interfitting and vented housing parts adapted for mounting on a support surface, vent means peripherally of one, lower part of said assemblage having angularly disposed deflecting means at the lower extremity thereof adapted to divert horizontal air streams to vertically and upwardly directed air streams within said assemblage, vent means in the other, upper part of said assemblage arranged to provide limited restriction to the escape of upwardly directed air streams from said assemblage, a liquid reservoir within said lower part, and means within said liquid reservoir for positioning the lower end of a vertically elongated evaporator element for free standing within said

assemblage, whereby liquid within said reservoir is introduced to upwardly moving air streams within said assemblage through prolonged contact with said evaporator element.

3,885,739

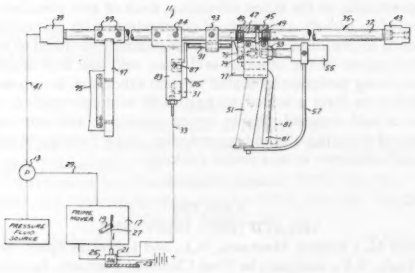
PRESSURE FLUID CLEANING DEVICE

Phillip E. Tuttle, P.O. Box 1213, Lakeworth, Fla. 33460

Filed Jan. 2, 1974, Ser. No. 430,153

Int. Cl. B05b *9/00*

U.S. Cl. 239—124 **8 Claims**



1. In a pressure fluid cleaning device having a pump connected to a source of fluid and having an outlet, a prime mover driveably connected to said pump, an electrically controlled speed control connected to said prime mover, a water gun having a pipe and an outlet nozzle for ejection of fluid under pressure, a conduit between said pump outlet and pipe, a normally open dump valve on and in communication with the pipe upstream of said nozzle, and a normally open electric switch on the gun for operating said speed control, the improvement comprising:

a first grip depending from said pipe;

a valve control pivotally mounted on said valve including a depending trigger arranged forward of said grip and having a first inoperative position;

a normally unseated valve assembly within said dump valve; said trigger having a second retracted position with said valve control operably engaging and seating said valve assembly cutting off flow through said dump valve;

a second grip spaced rearwardly of said first grip secured to and depending from said pipe, said switch being mounted on said second grip;

a switch control pivotally mounted on said second grip having a first inoperative position with one end spaced from said switch, and movable to a second position to close said switch;

and a safety pin slidably mounted upon said pipe and at its ends interposed between and engaging said valve control and said switch control normally retaining said switch control in its first position; whereby retraction of said trigger to its second position releases said pin so that said switch control may be successively moved to a second position to energize said speed control to shift said prime mover from idling to maximum speed for ejection of fluid through said nozzle at an increased predetermined pressure.

3,885,740

AUTOMATICALLY REVOLVED WASHING APPARATUS

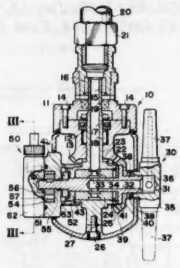
Kenji Sugino, Uozu; Hisataka Mori, and Hironobu Yamagata, both of Toyama, all of Japan, assignors to Sugino Machine Limited, Uozo, Japan

Filed Aug. 20, 1974, Ser. No. 499,038

Claims priority, application Japan, Aug. 23, 1973, 48-99299; Aug. 23, 1973, 48-99300; Aug. 23, 1973, 48-99301

Int. Cl. B05b *3/00*

U.S. Cl. 239—227 **6 Claims**



1. An automatically revolved washing apparatus comprising in combination:

a head body adapted to be connected to a pipe passage through which a washing fluid under high pressure is supplied,

a hollow shaft member disposed in said head body and communicated with said pipe passage,

a nozzle arm having an axially extending hollow space closed at one end portion thereof, said hollow space being communicated at the inner portion thereof with an axial space of said hollow shaft member,

a pair of nozzles symmetrically disposed relative to the axis of said nozzle arm and communicated with an opened outer end portion of said nozzle arm to rotate said nozzle arm about the axis thereof by means of the reaction of the jet flow through said nozzles,

gear means for revolving said nozzle arm relative to the axis of said head body while said nozzles are rotating about the axis of said nozzle arm, and

a trochoid pump provided at the opposite side of said nozzles to control rotary and revolving speeds of said nozzles, said trochoid pump having a cylindrical space into which a pump-drive shaft rotatable by the rotation of said nozzle arm extends, an external gear secured to said pump-drive shaft within said cylindrical space, an internal gear snugly disposed in said cylindrical space and engaged with said external gear, a closed fluid circulation passage communicating with an inlet and outlet of said cylindrical space, a fluid amount adjusting valve extending in said closed fluid passage, and a fluid material storage chamber communicating with said closed fluid passage, said storage chamber having a balance means to follow to increase and decrease of said fluid material.

3,885,741

APPARATUS FOR COOLING METAL WEBS

Elmar Wagener, Neukirchen-Vluyn, Germany, and Frantisek Jansch, Prague, Czechoslovakia, assignors to Demag A.G., Germany

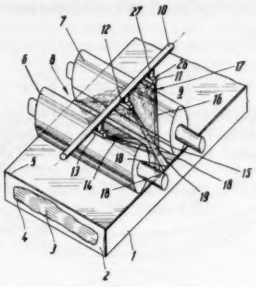
Division of Ser. No. 192,885, Oct. 27, 1971, Pat. No. 3,753,793. This application June 18, 1973, Ser. No. 370,914

Int. Cl. B05b *13/02*

U.S. Cl. 239—268 **2 Claims**

1. In apparatus for cooling a hot continuously moving metal web, and having a cooling zone, and a source of cooling liquid, the combination which comprises roller means for moving said web through said cooling zone, said roller means defining the longitudinal extent of said zone, a plurality of fan jet nozzles in said zone and spaced from the surface of said mov-

ing web; means providing flow communication between said source of said nozzles; said nozzles being fan-shaped to provide longitudinally extending slit-like orifices with said orifices being parallel to each other and positioned transverse to the longitudinal axis of said moving web; adjustable connecting means in said flow communication means for adjusting the spacing between said nozzles and said moving web and for maintaining the longitudinal axes of said nozzle orifices parallel to each other but spaced apart along said longitudinal axis of said moving web, allowing angular adjustment of each of said nozzles to provide a fan jet of cooling liquid issuing therefrom in a plurality of planes for impinging the surface of said moving web in said zone, and said fan jets impinge each other at a point spaced from the moving surface of said web in said zone, whereby the prismatic volume of said intersecting jets is expanded for impinging said web.



3,885,742

ATTACHMENT OF DRIP FEED DEVICES TO HOSES OR THE LIKE

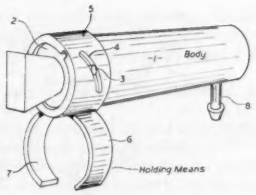
Stanley W. O. Menzel, Elizabeth, South Australia, Australia, assignor to Iplex Plastic Industries Pty. Ltd., Elizabeth, South Australia, Australia

Filed Feb. 6, 1974, Ser. No. 440,254

Claims priority, application Australia, Feb. 14, 1973, 2252/73

Int. Cl. B05b *1/20*

U.S. Cl. 239—272 **2 Claims**



1. A drip feed device comprising,

an elongaged body,

an inlet nipple near one end of said body adapted to be engaged in an aperture through the walls of a supply line to hold the body to the supply line and to place the drip feed device into communication with the water supply in said supply line, and

holding means on the said body remote from the said nipple to engage the said supply line and further hold the said body to the supply line when the nipple is engaged in the supply line, said holding means comprising two members, one at least shaped to partly surround the said supply line, the other positioned to hold the said shaped member to the supply line when the said nipple is engaged in the suppply line, the one said member being nearer to the said nipple than the other, whereby the said members can be engaged on the supply line when the body is angled to the supply line and then caused to hold to the said supply line when the body is orientated to engage the nipple in the aperture in the supply line.

3,885,743

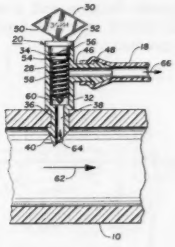
FLOW CONTROL DEVICE FOR PROVIDING LOW FLOW RATES

Harold E. Wake, Lindsay, Calif., assignor to Apache Corporation, Minneapolis, Minn.

Filed Sept. 5, 1974, Ser. No. 503,524

Int. Cl. B05b *15/00, 15/02, 1/34*

U.S. Cl. 239—542 **16 Claims**



1. A flow control device of the type suitable for use in a flow system which is supplied with fluid through a main hose comprising:

a. a female member having an open end and including inlet means for communicating with the main supply hose, outlet means and a portion having smooth internal walls disposed between said inlet means and said outlet means;

b. a male insert including a handle for assembling and disassembling the device and a helically threaded portion wherein, when the device is in its assembled position, said handle is disposed exteriorly of said open end, said helically threaded portion is disposed interiorly of said female member and cooperates with said portion thereof having smooth internal walls to form a helical flow path between said inlet means and said outlet means, and the device is capable of selective limited movement without disruption of the flow through the device; and

wherein said male insert and said female member include interengaging frictional retaining means which, when the device is in its assembled position, hold said male insert and said female member in engagement to seal said open end, prevent undesired movement of said male insert, and maintain the seal of the open end during limited movement of said male insert.

3,885,744

METHOD AND APPARATUS FOR CRUSHING AND SEPARATING SCRAP MATERIAL

David J. Drage, Park Forest, Ill., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 20, 1974, Ser. No. 471,273

Int. Cl. B02c *21/00*

U.S. Cl. 241—23 **9 Claims**

1. A method for the recovery of components of scrap material having mechanically intermingled ferrous metals, non-ferrous metals and non-metallic materials comprising the steps of:

a. passing the totality of said scrap through a freezing zone where it is cooled to cryogenic temperatures below the transition temperature of the ferrous matrix of the scrap;

b. crushing said scrap, while it is in cryogenically embrittled condition, in a first crushing zone, to effect a first size reduction thereof;

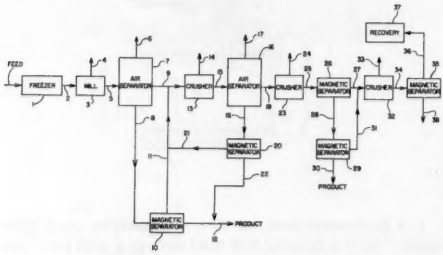
c. separating the discharge from said first crushing zone, in a first separating zone, into a dust, a first light fraction, and a first heavy fraction;

d. magnetically separating said first heavy fraction into a first magnetic fraction and a first non-magnetic fraction and said magnetic fraction being recovered as a ferrous product;

e. combining said first non-magnetic fraction with said first light fraction and feeding said combined fractions, at ambient temperatures, to a second crushing zone within which a second size reduction is effected;

f. separating the discharge from said second crushing zone, in a second separating zone, into a dust, a second light fraction and a second heavy fraction;

g. magnetically separating said second heavy fraction into a second magnetic fraction and a second non-magnetic fraction, said second magnetic fraction being recovered as a ferrous product;



h. combining said second non-magnetic fraction with the feed to said second crushing zone to recycle it therethrough;

i. feeding said second light fraction to a third crushing zone within which a third size reduction is effected;

j. magnetically separating the size-reduced effluent from said third crushing zone into a third non-magnetic fraction and a third magnetic fraction, said magnetic fraction being recovered as a ferrous product; and

k. continuing a series of crushings of magnetic fractions in a crushing zone, each followed by a magnetic separation of the crushed effluent into a magnetic product fraction and a non-magnetic fraction, said latter fraction being the feed for the next successive crushing zone, until a non-ferrous product stream is obtained which is essentially incapable of further magnetic separations.

3,885,745

WASTE PULPING MACHINE WITH REPLACEABLE SHEAR MEMBERS

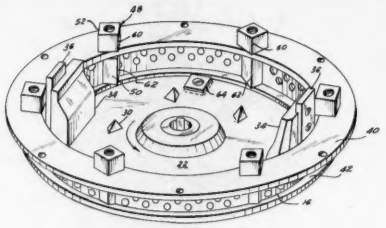
Robert W. Hankes, Downingtown; Eugene J. Schramm, Norristown; James C. Spiker, Honey Brook, and Frank T. Tober, Coatesville, all of Pa., assignors to Somat Corporation, Pomeroy, Pa.

Filed Nov. 19, 1973, Ser. No. 417,079

Int. Cl. B02c *13/14*

U.S. Cl. 241—46.11 **3 Claims**

1. In a waste disposal unit of the type having: a cylindrical tank for receiving waste material and water, a wall of said tank, the bottom portion of said tank extending radially inwardly from said wall, a disc impeller in said tank spaced from said wall and supported for rotary motion, means for rotating said impeller, a sieve ring encircling said impeller supported in said tank between said wall and said impeller, said sieve ring having a bottom edge and a top edge and being formed with a plurality of through apertures; the improvement comprising: a bottom ring supported in said tank encircling said impeller, said sieve ring bottom edge being seated on said bottom ring; a top ring encircling said impeller seated on the top edge of said sieve ring; said sieve ring comprising at least two identical interchangeable arcuate sections; first shear member support means secured to said impeller; second shear means support means secured stationary relative to said impeller; a first shear member removably mounted to said first shear member support means; second shear means mounted to said second shear means support means, said second shear means including a lower portion extending between said top and bottom rings interposed between said sieve ring arcuate sections and an upper portion axially aligned with said lower portion seated on



said top ring and projecting upwardly therefrom, each of said upper and lower shear means portions having four longitudinally extending cutting edges, said second shear means upper and lower portions being rotationally adjustably mounted to said second shear means support means so that upon rotational adjustment, a different cutting edge comes into play; said first shear member having a cutting edge for periodically coming into play with a cutting edge of said second shear means portions upon rotation of said impeller..

3,885,746

APPARATUS FOR REMOVING MATERIAL FROM A ROTATING SURFACE

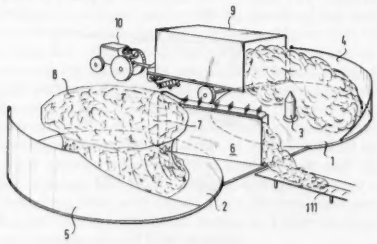
Ernst Weichel, Bahnhofstrasse 1, 7326 Heiningen, Germany

Filed May 22, 1973, Ser. No. 362,846

Claims priority, application Germany, May 25, 1972, 2225388

Int. Cl. B02c *18/22*

U.S. Cl. 241—279 **7 Claims**



1. Apparatus for removing a pile of stalks and leaves located on the support surface of a rotatably driven turntable and a conveyor pivotally displaceable across the support surface of said turntable, a cutting disc mounted on said conveyor and arranged to cut material from the pile of material on the support surface of said turntable, a discharge duct formed on said conveyor and arranged to receive and transport the material removed by said cutting disc, said conveyor along with its said cutting disc is arranged to be displaced from the periphery to the center of said turntable as said turntable rotates for removing material located on the support surface, wherein the improvement comprises two said turntables disposed in side-by-side relationship with the adjacent peripheral surfaces of said turntables disposed in spaced relationship, said conveyor being longitudinally elongated and extending between the

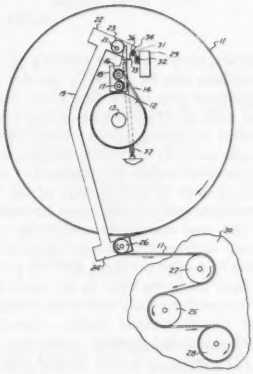
adjacent peripheral surfaces of said turntables, said conveyor being pivotally displaceable inwardly from the peripheral surfaces alternately over each of the support surfaces of said turntables, so that said conveyor and cutting disc can remove material from one said turntable while the other said turntable can be loaded, said conveyor extending from said turntable for moving the removed material to a selected disposal location, said cutting disc on said conveyor rotating about an axis extending in the longitudinal direction of said conveyor, and a motor operatively connected to said cutting disc for selectively driving it in opposite directions about its axis.

3,885,747

CONTROL DEVICE FOR ROLLED MATERIAL FEED

James R. Moss, Mount Clemens, and Walter Wilson, Northville, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 28, 1974, Ser. No. 455,753
Int. Cl. B65h *25/22*
U.S. Cl. 242—75.43 **2 Claims**



1. A device for controlling the feeding of rolled material in a feeding mechanism including means for applying a force to said material and having a supply spindle and a storage roller comprising:

a lever pivotably mounted in the proximity of said supply roller;

cam means fixedly mounted on said lever so that said lever and said cam means rotate in unison;

follower means pivotably mounted in the proximity of said cam means, said follower means being biased against said cam means so that rotation of said cam means causes rotation of said follower means;

means responsive to rotation of said follower means for applying and removing tension to said supply roller as said follower rotates in different directions;

switch actuating means arranged for rotation with said lever, said switch actuating means being configured to include two switching areas;

switch means in the proximity of said switch actuating means, wiper means for changing the condition of said switch, said wiper means being biased against said switch actuating means and causing the condition of said switch means to change upon reaching either of said switching areas; and

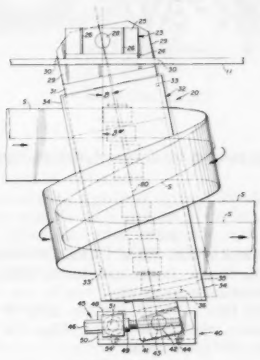
idler means rotatably mounted on said lever, the rolled material passing over said idler means to apply a rotating force to said lever so that said wiper means normally rests between said switching areas and rests on one of said switching areas when said force increases in response to forming of said material and the other of said switching areas when said material is exhausted.

3,885,748

TAKE-OUT ARBOR FOR A STRIP ACCUMULATOR

Anthony C. Costello, Strongsville; Leon L. Shaffer, Kent, and Robert G. Weatherby, Franklin, all of Ohio, assignors to Loopco Industries, Inc., Twinsburg, Ohio

Filed Mar. 28, 1974, Ser. No. 454,956
Int. Cl. B65h *75/02, 17/48*
U.S. Cl. 242—55 **17 Claims**



1. Apparatus for accumulating strip material in a processing line comprising means receiving the strip and forming an outer set of convolutions of the strip, means receiving strip from the outer set of convolutions and forming an inner set of convolutions of the strip, and arbor means receiving strip from the inner set of convolutions before the strip is transferred to the processing line, said arbor means having an axis which is angular to the path of the strip as received from the inner set of convolutions, and means to adjust the angularity of the axis of said arbor means with respect to the path of the strip to maintain the strip in line with the processing line.

3,885,749

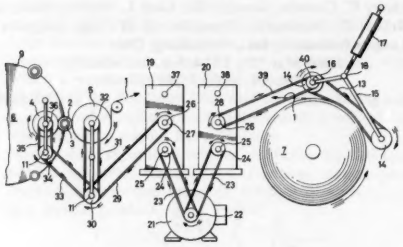
WINDING DEVICE FOR WINDING ROLLS OF STRIPS OR RIBBONS

Stephen J. Skacel, Augustin-Mulldorf, Germany, assignor to Waldmann-Verpackung KG, Altenberg, Germany

Filed Mar. 7, 1973, Ser. No. 338,908
Claims priority, application Germany, Mar. 8, 1972, 2211076
Int. Cl. B65h *19/26, 19/28*
U.S. Cl. 242—56 A **29 Claims**

1. A fully automatic winding device for winding rolls from material in strip or ribbon form, said device comprising in combination: at least one wind-up spindle for winding thereupon a roll of the material, a first and a second pressure roller movable into engagement with material supported on said spindle for pressing material against the spindle proper or material already wound thereupon, said wind-up spindle being freely rotatable and said pressure rollers driving said spindle, and a supply spool for withdrawing material to be wound therefrom, driving of the wind-up spindle by said pressure rollers causing withdrawal of material from said supply spool, and centrally disposed variable speed power drive means

coupled to said pressure rollers and said supply spool, said drive means including gearing means causing driving of the



pressure rollers and the supply spool without slippage and in synchronism.

3,885,750

PHOTOGRAPHIC FILM TAKE-UP SPOOL

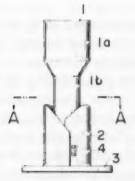
Takeshi Ikeuchi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1973, Ser. No. 360,729

Claims priority, application Japan, May 19, 1972, 47-59310; Aug. 25, 1972, 47-99033

Int. Cl. B65h *75/28*

U.S. Cl. 242—74 **6 Claims**



1. A take-up spool for film having perforations comprising a lower base member rotatable in a forward film take-up direction about a vertical axis and located at an end of said spool, a first wall section extending upwardly from said base member parallel to said axis and having an outer cylinderical face and a tail section projecting peripherally, rearwardly, relative to said forward rotation of said base member and having an upper edge which is upwardly, peripherally inclined from the rear end of said tail section, a second wall section extending upwardly from said base member parallel to said axis and having an outer cylindrical face and a tongue section projecting peripherally forwardly beneath and spaced inwardly of said tail section a film perforation engaging tooth projecting radially, outwardly from said second wall section spaced proximate to and rearwardly of the rear end of said tail section and extending outwardly to a point inwardly of a cylindrical plane extending between the outer faces of said wall section, and a shaft extending from said base member above the top of and surrounded by said wall sections and having a peripheral face spaced inwardly from the inside faces of said wall sections.

3,885,751

TAPE CARRIER FOR RECORD TAPES AND THE LIKE

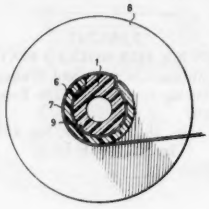
Heinz Kelch, Buchenberg; Hilmar Kirchgessner, and Eduard Schuh, both of Villingen, all of Germany, assignors to Kienzle Apparate GmbH, Villingen, Germany

Filed Mar. 26, 1974, Ser. No. 454,819

Claims priority, application Germany, Mar. 29, 1973, 2315717

Int. Cl. B65h *75/28*

U.S. Cl. 242—74.1 **9 Claims**



1. A tape carrier, particularly for carrying recording tapes, comprising a resilient clip of generally circular cross-section having a longitudinal axis and a first outer circumferential surface formed with an axial slot extending parallel to said axis, and bounded by edge portions of said clip; and a core body having a second outer circumferential surface and being adapted to be received within the confines of said clip by a snapping action so that an end portion of the tape may be clamped intermediate said second outer circumferential surface and said clip, said core body comprising a rib portion, having an arcuate surface portion and being received in said slot intermediate said edge portions, said rib portion projecting outwardly from said core body to an extent so as to form a substantially circumferentially complete configuration with said first outer circumferential surface, whereby the tape adjacent said clamped end portion which has been passed between said rib portion and one of said edge portions is passed over said arcuate surface portion in a smooth and continuous manner without pressure-marking the tape.

3,885,752

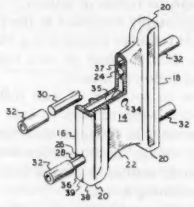
POCKET REEL

Gerald G. Noffsinger, Rt. 1, Box 147-N, Eatonville, Wash. 98328

Filed Mar. 4, 1974, Ser. No. 448,072

Int. Cl. B65h *75/02*

U.S. Cl. 242—96 **2 Claims**



1. A lightweight compact pocket size reel to receive, for example, fishing line, comprising:

a. a central elongated rectangular body;

b. two elongated rectangular side portions adjacent to the central elongated body, of greater length than the central elongated body, and extending beyond the central elongated body to define a line receiving volume;

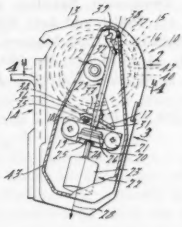
c. passageway structures extending straight through the central elongated body and on through the elongated side portions at two locations equally spaced from the center of the central elongated body;
d. rotatable handles, having a constant diameter that is less than the diameter of the passageway structures, one rotatable handle being longer than the other, and both rotatable handles extending completely through the passageway structures to be used by the fisherman in creating relative circular movement of the central elongated body to take in or let out active lengths of fishing line;
e. sleeves, tightly fitted to the ends of the rotatable handles, to serve as finger grips and as stops to keep the rotatable handles in part confined in the passageways of the elongated central body and elongated side portions.

3,885,753

SEAT BELT RETRACTOR MECHANISM

David G. Connors, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 14, 1974, Ser. No. 451,314
Int. Cl. B65b *75/48*
U.S. Cl. 242—107.4 **8 Claims**



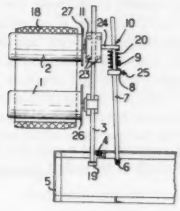
1. A seat belt retractor mechanism having a belt receiving reel rotatably mounted on a shaft journalled in side walls of a support bracket,
the reel at each of its ends having circular ratchet plates with peripheral ratchet teeth,
a locking bar paralleling the reel shaft and pivotally mounted in the bracket side walls for movement into engagement with the circular ratchet plates to lock the reel against rotation in seat belt protraction direction,
and an inertia sensor comprising a pendulum for driving the locking bar into circular ratchet plate engagement,
wherein the improvement comprises:
a substantially vertical, elongated, drive link paralleling one side wall of the support bracket,
the drive link at one end having a first portion abutting the pendulum and a second portion having an interlocking connection with the locking bar,
the drive link at its other end having a pawl appendage,
an annular ratchet plate having internal ratchet teeth,
the annular ratchet plate being secured to a circular ratchet plate for rotation with the latter and thereby the reel,
the pendulum when accelerated causing the drive link to be raised an initial distance to place its pawl appendage into ratchet engagement with the annular ratchet plate,
the interlocking connection between the drive link and the locking bar having a lost motion segment wherein the locking bar is nonresponsive to initial movement of the driving link,
rotation of the reel caused by protraction forces exerted on the belt subsequent to pendulum displacement causing the annular ratchet plate to further raise the drive link to drive the locking bar into engagement with the circular ratchet plate to lock the reel against further movement in belt protraction direction.

3,885,754

HANK CARRIER

Dominique Michel Delerue, 43, rue de la Briqueterie, F-59420 Mouvaux, France

Filed May 29, 1973, Ser. No. 364,615
Claims priority, application France, May 29, 1972, 72.19213; Oct. 27, 1972, 72.38294
Int. Cl. B65h *49/30, 75/24*
U.S. Cl. 242—127 **7 Claims**



1. Hank carrier apparatus for unwinding a hank of yarn in an upward direction, comprising:
a. a chassis carrying a pivoting support, pivotable between a vertical position for placement of the hank and a horizontal position for upward unwinding of the hank;
b. two substantially parallel arms on said support, said arms being pivotable on their axes;
c. at least one of said arms being slide-mounted on said support to reduce the separation of said arms when said support is vertical, and to increase the separation of said arms when said support is horizontal, thereby tensioning the hank during unwinding;
characterized by
d. a lever pivotable at one end on said chassis and slidably coupled to said slide-mounted arm at the other end, the chassis pivot points of said support and said lever and the coupling point of said slide with said lever forming a triangle having one side of fixed length and two sides of variable length; and
e. means on said lever for maintaining pressure against said slide mounted arm away from the other arm, the side of said triangle formed by said lever being shortened by pivoting said support from its vertical to its horizontal position, thereby activating said means for maintaining pressure.

3,885,755

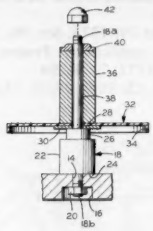
PORTABLE SOLDERING FIXTURE

Dominic S. Bezrutczyk, 286 Lawlor St., New Britain, Conn. 06051

Filed Jan. 9, 1974, Ser. No. 431,921
Int. Cl. B65h *49/00;* **D01h** *7/16*
U.S. Cl. 242—129.5 **7 Claims**

1. A fixture particularly suited as a support for a holder of material comprising:
a. a base operable for supporting the fixture on a supporting surface;
b. a shaft having at least one end thereof threaded and having shoulder means formed intermediate the ends thereof operable to provide said shaft with a portion having a differing diameter;
c. mounting means fixedly mounting the other end of said shaft on said base at least a portion of said shaft lying in a plane perpendicular to the principal plane of said base;
d. a coil support operable for receiving a holder of material thereon supported on said shaft for rotation relative thereto at a location along the length thereof determined by said shoulder means; and
e. retaining means detachably mounted at said one end of said shaft for retaining said coil support rotatably

mounted on said shaft, said retaining means comprising a washer positioned on said shaft in engagement with one



end of said coil support and a cap nut tightened on said one end of said shaft in threaded engagement therewith.

3,885,756

AUTOMATIC THREADING APPARATUS

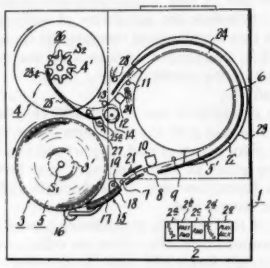
Seigo Uehara, and Jin Yamagishi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 2, 1973, Ser. No. 337,443

Claims priority, application Japan, Mar. 7, 1972, 47-27625

Int. Cl. G11b *15/66*

U.S. Cl. 242—195 **14 Claims**



1. An apparatus for automatically threading a tape-like member having a leader extending from at least one end and being distinguishable from said tape-like member, said apparatus comprising tape drive means for transporting said leader and said tape-like member in succession along a predetermined tape path, said tape drive means being manually controllable for selectively providing at least first and second modes of transportation of said tape-like member, tape sensing means at a location adjacent said tape path for distinguishing between the presence, at said location, of said leader and said tape-like member, respectively, and providing corresponding distinctive indications, drive control means responsive to said indications provided by the sensing means for controlling said tape drive means, and timing means for determining the control of said tape drive means by said drive control means in response to said indications in dependence on at least first and second predetermined time periods, said timing means including condenser means having at least two condensers, condenser charging means operative in response to the distinctive indication from said sensing means corresponding to the presence of said leader at said location for charging said condenser means at a predetermined rate, means for connecting said two condensers in parallel with said condenser charging means when said first mode of transportation is selected so that said condenser means attains a predetermined charge level in said first time period while being charged at said predetermined rate, means for disconnecting one of said condensers from said condenser charging means when said second mode of transportation is selected so that said condenser means then attains said predetermined charge level in said second time period while being charged at said predetermined rate, means responsive to said predetermined charge level on said condenser means for determining said first and second time periods when said first and second modes of transportation are respectively selected, and means for discharging said condenser means in response to the distinctive indication from said sensing means corresponding to the presence of said tape-like member at said location.

3,885,757

RECEIVING-AND-DISPATCHING STATION

Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61, both of Moscow; Dmitry Rudolfovich Gun, Komsomolskaya ulitsa, 7, kv. 29, Ljubertsy, Moskovskaya oblast; Ilya Solomonovich Kantor, Malo-Moskovskaya Ulitsa, 31, kv. 45, Moscow; Avtandil Semenovich Kakhniashvili, ulitsa Eliava 37, kv. 41, Tbilisi; Jury Arnoldovich Topolyansky, Matveevskaya ulitsa, 10 korpus 4, kv. 233, Moscow; Ippolit Davidovich Suladze, prospekt Chavchavadze, 11, kv. 41, Tbilisi, and Jury Abramovich Tsimbler, Sojuzny prospekt 10, kv. 261, Moscow, all of U.S.S.R.

Filed July 24, 1974, Ser. No. 491,517

Claims priority, application U.S.S.R., July 27, 1973, 1954150

Int. Cl. B65g *51/32*

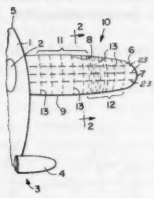
U.S. Cl. 243—19 **2 Claims**

1. A receiving-and-dispatching station of the installation for pneumatic transportation of containerized cargoes located between any adjacent sections of a pipeline and comprising: a loading-and-unloading chamber one end of which adjoins one of said pipeline sections; a carriage installed between the other end of said loading-and-unloading chamber and the other one of said pipeline sections; a pipe section whose inside diameter is approximately the same as the inside diameter of said pipeline sections and which is secured on said carriage so that one of its ends adjoins the other end of said loading-and-unloading chamber while its other end adjoins the other one of said pipeline sections; a device for braking the containers and pushing them into said loading-and-unloading chamber, located in said pipe section; another pipe section whose length and inside diameter are practically equal to the length and inside diameter of said first pipe section and which is secured on said carriage parallel to said first pipe section; a drive of said carriage providing for its reciprocating motion across the geometrical axes of said pipe sections for placing them alternately between said loading-and-unloading chamber and the other pipeline section so that, when said first pipe section is set coaxially with the loading-and-unloading chamber, said containers are stopped and moved into said loading and unloading chamber while after placing said other pipe section coaxially with the loading-and-unloading chamber, said containers pass through said loading-and-unloading chamber.

3,885,758
AIRPLANE WING CAMBER CONTROL

Thomas L. Croswell, Jr., Vienna, Va., assignor to Thomas L. Croswell, Jr., Baden, Pa.

Continuation-in-part of Ser. No. 201,417, Nov. 23, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,399
Int. Cl. B64c *3/44*
U.S. Cl. 244—44 **16 Claims**



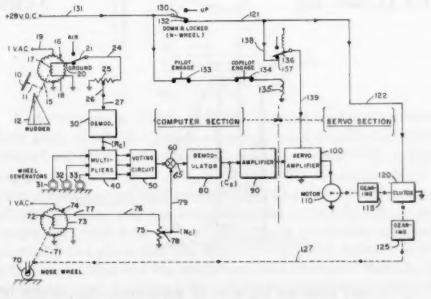
7. A fluid flow controlling member having opposed fluid contacting surfaces defining a leading edge and a trailing edge with respect to the relative fluid flow; a plurality of generally parallel pretensioned wires generally extending in the direction from said leading edge to said trailing edge closely adjacent at least one of said surfaces and said pretensioned wires maintain said surfaces in a predetermined shape; and means selectively heating only the wires in said one surface for thermally expanding said pretensioned wires to expand said member in the direction of fluid flow on the side having said one surface to a greater extent than the other side having the other surface to generally warp said member from its leading edge to its trailing edge in a smooth manner.

12. A method for controlling the curvature of a fluid flow control member having a leading edge generally transverse to the fluid flow, a trailing edge generally transverse to the fluid flow, opposed surfaces over which the fluid flows, and opposed structural generally parallel wires extending in the direction of fluid flow and respectively adjacent each surface, comprising: selectively heating only the structural wires adjacent one surface for a portion of said member to expand the heated structural wires on the one side to at least an extent greater than the structural wires adjacent the other surface to curve the member in cross section generally from said leading edge to said trailing edge.

3,885,759
NOSE WHEEL STEERING SYSTEM

William P. Lear, Verdi, Nev., assignor to Lear Avia Corporation, Reno, Nev.

Filed June 21, 1973, Ser. No. 372,400
Int. Cl. B64c *25/50;* **B62d** *5/04*
U.S. Cl. 244—50 **7 Claims**

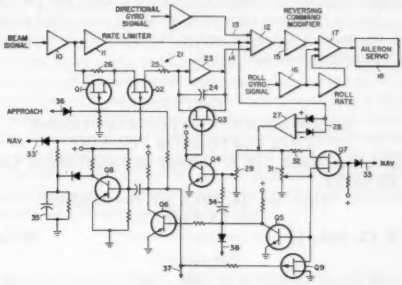


1. A steering system for an aircraft having a pilot steering command member and a nose wheel that effects steering of the aircraft on the ground, comprising first transducer means coupled to the command member for generating an a.c. signal (R_c) that corresponds in phase and magnitude to the steering command of the pilot on the member, generating means of plural signals (V_n) that correspond to the ground speed of the aircraft, multiplier means including an individual multiplier unit for each of said (V_n) signals to provide n resultant signals (E_n) each of which corresponds to $R_c \cdot (1/V_n)$ respectively, a voting circuit with a section connected to each E_n signal, said voting circuit selecting as its output the mid-value (E_m) of the (E_n) signals, second transducer means coupled to the nose wheel for generating an a.c. signal (N_c) that corresponds in phase and magnitude to the angular position of the nose wheel, circuit means responsive to said (E_m) and (N_c) signals to provide a net servomotor control signal, and servomotor means mechanically coupled to the nose wheel and in circuit connection with said circuit means whereby the nose wheel is angularly positionable for steering the aircraft within a predetermined variable authority command range that corresponds to the elected (E_m) signal.

3,885,760
AUTOPILOT RADIO GUIDANCE SIGNAL CIRCUIT INCLUDING CONTROLLED INTEGRATOR

Alton O. Grimes, Fort Lauderdale, and Frank D. Pugh, Pompano Beach, both of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 8, 1974, Ser. No. 449,318
Int. Cl. B64c *13/20*
U.S. Cl. 244—77 B **5 Claims**



1. A radio command signal circuit for an aircraft autopilot comprising:

means supplying a radio guidance signal the amplitude and polarity of which is related to the displacement of the aircraft off the desired radio course;

integrating means providing an output proportional to the time integral of said radio guidance signal, said integrating means having control means for rendering said output zero;

means supplying said radio guidance signal and said output of said integrating means to the autopilot to cause said autopilot to steer the aircraft in a direction to reduce the amplitude of said radio guidance signal;

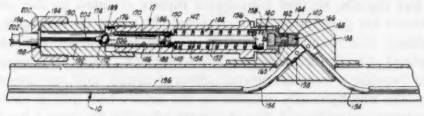
threshold means for actuating said integrating means control, said threshold means being operative at signal levels of said radio guidance signal equalling or exceeding a first upper level to hold output from said integrating means at zero and being operative at a second lower level for momentarily rendering output from said integrating means zero; and

means for setting said second lower level of said threshold means at one value when the source of said radio guidance signals is VOR and at a second value when the source of said radio guidance signals is ILS.

3,885,761
AIRCRAFT EMERGENCY EGRESS SYSTEM

Daniel O. Pendergast; William T. Engel, both of Arlington, and Vernon R. Dorrough, Grapeville, all of Tex., assignors to Jet Research Center, Arlington, Tex.

Filed Mar. 5, 1974, Ser. No. 448,324
Int. Cl. B64c *1/32*
U.S. Cl. 244—121 **22 Claims**

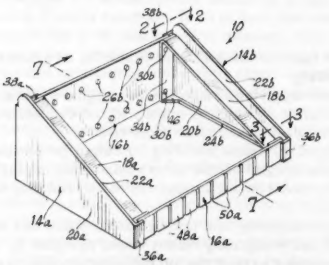


1. A vehicle emergency egress system comprising:
at least one explosive cutting assembly for explosively forming an opening in the body of said vehicle;
one explosive initiator assembly per each explosive cutting assembly, wherein each explosive initiator assembly is positioned adjacent an explosive cutting assembly for detonating said explosive cutting assembly;
at least one manually actuated firing handle;
a junction box comprising a housing and a block slidably mounted in said housing, said block having an initiator side and a handle side;
one elongated mechanical actuating linkage per each explosive initiator assembly, wherein each said linkage is connected at one of its ends to an explosive initiator and at the other of its ends to said initiator side of said block; and
one elongated mechanical actuating linkage per each firing handle, wherein each said linkage is connected at one of its ends to a handle and at the other of its ends to said handle side of said block.

3,885,762
ADJUSTABLE STAND FOR ELECTRONIC CALCULATORS OR THE LIKE

Ben A. Sebastiani, 218 E. Nottingham Ln., Hoffman Estates, Ill. 60172

Filed Nov. 14, 1973, Ser. No. 415,546
Int. Cl. F16f *15/02*
U.S. Cl. 248—13 **10 Claims**

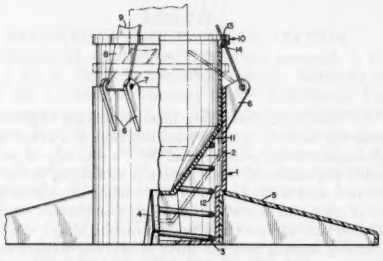


1. An adjustable stand for an electronic calculator or other device,
comprising left and right side members,
front and rear members for extending between said side members,
first fastening elements on said front and rear members,
and second fastening elements on said side members for mating with said first fastening elements to secure said front and rear members between said members,
said front and rear members having modules which can be removed from said front and rear members to adjust the size of said stand,
said front and rear members having a series of said fastening elements on said modules whereby new sets of said first fastening elements become operative as said modules are removed from said front and rear members.

3,885,763
SUPPORTING STAND PREFERABLY ADAPTED FOR SUPPORTING A CHRISTMAS TREE

Sigvard E. Blom, Sodermannagatan 37 116, 38 Stockholm, Sweden

Filed Nov. 20, 1973, Ser. No. 417,525
Int. Cl. A47g *33/12*
U.S. Cl. 248—44 **3 Claims**

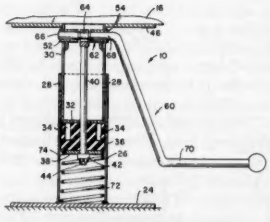


1. Supporting stand for a supporting a Christman tree or similar object, comprising an outer container, an inner container, said inner container being slideably arranged within said outer container and capable of holding substantial quanity of water, said inner container having further a conical lower part and in its upper end outwardly projecting portions having slots, arms each slideably extending through one of said slots, lugs extending outwardly from the upper portion of said outer container, and each having one of said arms pivotally connected thereto, said arms having free ends positioned for pressing aganist the tree trunk when the tree is placed in said inner container and the latter as a consequence thereof by means of the gravity of the tree is displaced thereby pivoting said arms under control of said slots, a coil spring being interposed between said inner and said outer container for holding said inner container in such a position that its upper end is located at a predetermined distance above the upper end of said outer container.

3,885,764
SEAT PEDESTAL

Robert M. Pabreza, Jackson, Mich., assignor to Excel Industries, Incorporated, Elkhart, Ind.

Filed July 25, 1973, Ser. No. 382,329
Int. Cl. F16m *11/28*
U.S. Cl. 248—162 **3 Claims**



1. A seat pedestal capable of supporting the weight of a person comprising an upstanding first tubular element, a second tubular element telescopingly received in the first tubular

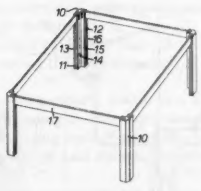
element for support of a seat, an elastomeric block within the first tubular element, said block being out of engagement with the inner surface of the first tubular element when the block is in a relaxed state, means securing said block to the second tubular element for movement therewith, said means for securing said block to the second tubular element for movement therewith comprising a first plate affixed to the lower end of said second tubular element, said first plate including downwardly extending pin elements extending into the block in securement therewith, a plurality of peripherally spaced apart inwardly extending ribs on the upper end of said first tubular element defining a bearing surface for said second tubular element, said first plate being of slightly greater diameter than said second tubular element whereby the peripheral edges of said second plate will contact said ribs upon extreme upward movement of said second tubular element to thereby prevent separation of the tubular elements, actuator means to compress the block in the direction of the longitudinal axis of the first tubular element with consequent radially outward expansion of the block to frictionally engage the inner surface of the first tubular element and releasably secure said tubular elements together to prevent relative movement therebetween, said actuator means being operable to release the block to permit relaxation thereof to thereby permit simultaneous vertical and rotative adjustment of the second tubular element with respect to the first tubular element, said actuator means including a second plate in abutment with the underside of said block, means to raise and lower said second plate for compression and relaxation of said block comprising a rod extending from said second plate and through said block and terminating at its upper end at a point adjacent the upper end of the second tubular element, crank means affixed to the upper portion of the second tubular element in engagement with the upper end of the rod to cause raising and lowering of the rod, said crank means comprising a crank arm extending exteriorally of the second tubular element for manual engagement, a ring-like element on the upper end of said rod, and an offset crank portion connected to the crank arm and located within said ring-like element for raising and lowering of the rod upon turning of the crank arm.

3,885,765

FURNITURE FRAMES

Adrian John Richards, 835 Fulham Rd.-S.W.6, London, England

Filed Apr. 17, 1973, Ser. No. 351,892
Int. Cl. F16b *5/00*
U.S. Cl. 248—188.1 **3 Claims**



1. A rectangular furniture frame comprising four leg members each of which consists of an extruded profile bar with a pair of continuous longitudinal grooves substantially at right angles to each other and symmetrically arranged about a centre line through the cross-section of said bar at 45° to each of said grooves, said bar being bevelled externally across said centre line, and four rail members each consisting of a substantially flat plane bar the ends of which are located in the grooves of adjacent leg members and clamped therein, by screws inserted from the inside of the leg members, so as to lie with its top surface flush with the top surface of the corresponding leg members.

3,885,766

MODULAR SEATING ASSEMBLY

Richard J. Resch, and Robert J. Bomber, both of Green Bay, Wis., assignors to Krueger Metal Products, Incorporated, Green Bay, Wis.

Filed Dec. 26, 1973, Ser. No. 427,620
Int. Cl. F16m *11/20*
U.S. Cl. 248—188.1 **9 Claims**

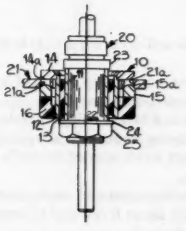
1. In combination, a horizontally disposed support beam having a rectangular cross section and opposed parallel sides, and a clamp for fastening furniture elements to said support beam, said clamp comprising a channel member including spaced wall portions interconnected by a web, said wall portions including spaced discontinuous surfaces converging toward each other within said channel and toward said web, said converging surfaces being engageable in a friction fit with said opposed sides of said beam, threaded apertures in said channel member wall portions, said clamp including a clamping plate with openings arranged at a spacing greater than the width of said beam and bolts extending through said openings into said threaded apertures and located adjacent the sides of said beam to urge said beam between said converging surfaces against the frictional contact of said beam and said converging surfaces into abutment with said web.

3,885,767

SNAP-IN MOUNTING AND MOUNTING ASSEMBLY

Edward J. Olowinski, 1136 W. 34th St., Erie, Pa. 16508, and Ernest H. Atkinston, 556 Timber Valley Rd., N.E., Atlanta, Pa. 30305

Filed Jan. 23, 1974, Ser. No. 435,800
Int. Cl.² F16F *15/04*
U.S. Cl. 248—204 **16 Claims**



1. A snap-in mounting comprising
concentrically spaced inner and outer elongate rigid sleeves subject to relative movement,

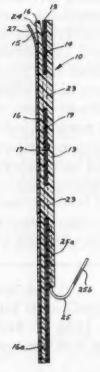
elastomeric means interposed and secured between said sleeves and resiliently accommodating said relative movement,
flange means carried by and adjacent one end of said outer sleeve and extending radially outward therefrom, and
lock means resiliently carried by and adjacent the other end of said outer sleeve in opposed relation to said flange means, said lock means being normally maintained in a predetermined axially spaced relation to said flange means and resiliently resisting movement relative to said flange means,
said lock means comprising an annular lock ring concentrically disposed about said outer sleeve in opposed relation to said flange
means and an annular elastomeric member having an L-shaped cross
section with the end of one of said legs secured to said outer sleeve and
the end of the other of said legs secured to said lock ring.

3,885,768

SEPARABLE SELF-SECURING HOLDING DEVICE

Bruce J. Frye, 13601 69th Ave. N., R.R. No. 2, Osseo, Minn. 55369

Filed Aug. 8, 1973, Ser. No. 386,751
Int. Cl. A47f 7/14; A47g 1/17
U.S. Cl. 248—467 **2 Claims**



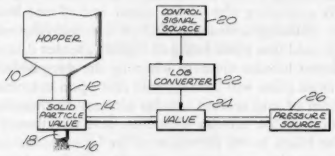
1. A separable self-securing article holding device, having in combination
a body portion comprising a pair of layers,
one of said layers being rigid,
and other of said layers being flexible,
said layers being separably conected by a plurality of spaced-apart welds spaced inwardly of the peripheries of said layers,
said welds being arranged and constructed to withstand considerable shear force and to separate under relatively small tear force,
said flexible layer having an adhesive outer surface layer, and
article holding means carried by said rigid layer, said rigid layer distributing the load carried by it over said welds without exerting any significant pull at the edge portions of said flexible layer.

3,885,769

VARIABLE FLOW-CONTROL VALVE

Wallace T. Morrison, Whittier, Calif., assignor to Stoody Company, Santa Fe Springs, Calif.

Filed June 20, 1973, Ser. No. 371,802
Int. Cl. F16k 7/07
U.S. Cl. 251—5 **4 Claims**



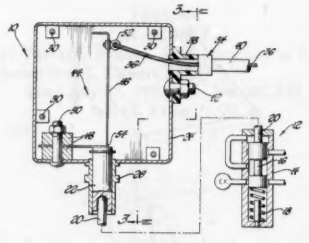
1. A flow valve for controlling flow of a substance in accordance with a control signal comprising:
means defining a flow passage for said substance;
a somewhat tubular member of resiliently-deformable material, defining at least three internally-extending radial intrusions for abutting engagement to variously close said tubular member, said tubular member being fixed to receive substance from said flow passage;
a housing member receiving said somewhat tubular member to provide a somewhat annular operating space about said tubular member, and said tubular member having the characteristic of being non-linearly responsive to a pressure applied to said space for deforming same; and
fluid control means non-linearly responsive to said control signal for developing a pressure in said operating space that is non-linearly related to said control signal, whereby to linearize the response of said tubular member to control flow in accordance with said control signal.

3,885,770

TRANSMISSION ASSEMBLY

Richard D. Houk, Stow, Ohio, assignor to Teleflex Incorporated, North Wales, Pa.

Filed Sept. 24, 1973, Ser. No. 400,359
Int. Cl. F16k 31/44; B60k 31/00
U.S. Cl. 251—294 **8 Claims**

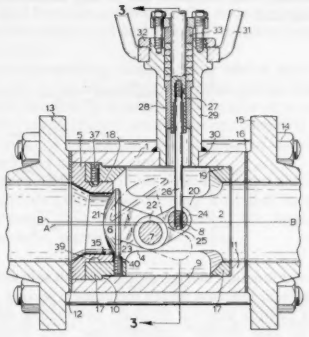


1. A transmission assembly comprising; a modulator valve, a motion transmitting remote control including guide means and a flexible motion transmitting core element movably supported by said guide means, and a flexible lever means extending in a cantilevered fashion from a support and engaging said valve, said core element being attached to said lever means for actuating said valve upon movement of said core element, said lever means including a flat spring, said spring engaging said valve at a position between said support and the attachment to said core element.

3,885,771
ECCENTRIC ROTARY PLUG VALVE WITH QUICK REMOVAL TRIM INSERT

Hans D. Baumann, 29 Villa Dr., Foxboro, Mass. 02035

Continuation-in-part of Ser. No. 456,757, April 1, 1974. This application Aug. 26, 1974, Ser. No. 500,306
Int. Cl. F16k *1/20*
U.S. Cl. 251—298 5 Claims



1. Eccentric rotary plug valve with quick removal trim insert comprising:

a. a tubular housing;

b. one inlet and outlet end formed in said housing, said inlet and outlet ends adapted to be coupled to a pipeline;

c. a straight cylindrical passage formed in said housing and extending from one end of said housing towards a shoulder near the other end of said housing providing at that point a reduced cross-section, said passage additionally having a slightly enlarged diameter portion near the inlet side;

d. a cylindrical insert assembly removably placed within the straight cylindrical passage having a raised diameter portion slidingly engaging the slightly enlarged diameter near the inlet side of said housing and engaging a stop shoulder formed at the terminating end of said enlarged portion of said passage, leaving the remaining length of said insert assembly unrestrained within said straight cylindrical passage of the housing;

e. a bore or passage extending throughout the central length of a yoke forming the retaining shell of said insert assembly;

f. a seatring guiding closely within one end of the bore of said yoke or housing and having a flanged portion engaging one terminating end of said yoke within the slightly enlarged portion of said straight cylindrical housing passage;

g. a shaft located perpendicular to and off-set from the longitudenal axis of said yoke and being retained on either end by the outer walls of said yoke;

h. an eccentrically rotating plug tiltingly engaged on said shaft and within the central bore or passage of said yoke by a hub, said plug having a fully or partly spherical head portion suitably connected to the hub, said head portion engaging and cooperating with a bore of said seatring, and wherein the center of said sphere is located essentially along the central axis of said seatring bore;

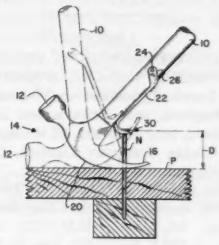
j. means to tiltingly move said valve plug;

k. actuating means connected exterior of said housing and cooperating with said means to tiltingly move the valve plug.

3,885,772
NAIL PULLER FOR CLAW HAMMER

Carl E. Balkus, Jr., 147 Deepwood Dr., Amston, Conn. 06231

Filed May 15, 1974, Ser. No. 470,333
Int. Cl. B66f *15/00*
U.S. Cl. 254—26 4 Claims



1. In a claw hammer which includes a handle and has a head provided at one end of the handle, which head has a nail driving anvil portion and also a nail pulling portion defined by projecting claws and a convex fulcrum surface, the improvement comprising:

a. a link one end of which is pivotally connected to the handle in spaced relation to said nail pulling portion,

b. auxiliary projecting claws at the opposite end of said link, said auxiliary claws being spaced above said claws in said head when said link is in a normal position alongside the handle,

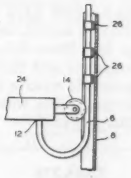
c. means for normally biasing said link toward its normal position alongside the handle, and

d. said link being so arranged with respect to said handle and said fulcrum in said head that said link is pivoted away from the handle when said auxiliary claws are used to draw a nail.

3,885,773
MAGNETIC CABLE TAKEUP DEVICE

Thomas L. Dunkelberger, Richland, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 6, 1974, Ser. No. 467,023
Int. Cl. B66d *1/36*
U.S. Cl. 254—190 R 9 Claims



1. Apparatus for magnetically restricting the lateral movement of a flexible energy conduit extending between an energy source and an energy consumer movable with relation thereto including:

an energy source,

an energy consumer capable of movement relative to said energy source,

a flexible energy conduit extending between said energy source and said energy consumer,

a rigid conduit restraining member extending in a plane substantially parallel to the path of relative movement between said energy consumer and said energy sources, magnetic means for magnetically attracting said flexible energy conduit to said conduit restraining member and

restricting the lateral movement of said conduit from said restraining member,

whereby said conduit is held against said restraining member and allowed to be removed therefrom against the force of said magnetic means as said energy consumer moves relative to said fixed energy source.

3,885,774

APPARATUS FOR PREPARING AND DISPENSING MIXTURES OF CONCRETE AND FIBRES

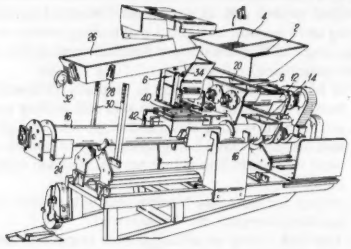
David Michael Harris, Egmanton, near Newark; James Albert Harvey, Collingham, near Newark, and John Alfred Clipston, Edwinstowe, near Manfield, all of England, assignors to Caledonian Mining Company Limited, Carlton-on-Trent, Newark, Nottinghamshire, England

Filed July 18, 1973, Ser. No. 380,193

Claims priority, application United Kingdom, July 22, 1972, 34391/72; Sept. 26, 1972, 44369/72; Sept. 29, 1972, 45003/72; Dec. 5, 1972, 56151/72; Dec. 5, 1972, 56152/72

Int. Cl. B28c *7/04*

U.S. Cl. 259—165 **7 Claims**



1. A mixing machine particularly adapted for use in the production of a fibrous mix, said machine comprising,

a first hopper for a first feedstock,

a first feed screw disposed in fixed relation to said first hopper, said first feed screw being adapted to receive the first feedstock discharge from said first hopper,

a blending scroll having first and second charging ports, said blending scroll being positioned relative to said first feed screw to receive through said first charging port the first feedstock discharge metered from said first feed screw, and

a fiber hopper having a screen fixed at the outlet thereof onto which fibers may be loaded, said hopper being positioned to discharge said fibers directly into said second charging port provided for said blending scroll, and said hopper being reciprocable relative to said second charging port for discharging fibers within said fiber hopper into said second charging port.

3,885,775

VEHICLE SUSPENSION DEVICE

Germain C. Bolduc, 54 Rabbit Rd., Salisbury, Mass. 01950

Filed Jan. 24, 1974, Ser. No. 436,220

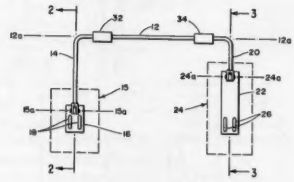
Int. Cl. B60g *21/02*

U.S. Cl. 267—11 **6 Claims**

1. In an automotive vehicle having a sprung frame assembly and an unsprung drive axle assembly, said axle assembly including two wheels and a wheel driving means and housing therefor, said housing having a section associated with each of said wheels, the improvement comprising a suspension device including:

a. a cross-bar having a first arm extending from a point near one cross-bar endpoint and being associated with the housing section associated with with one of said wheels, and a second arm extending from a point near the other cross-bar endpoint, and being associated with the housing section associated with the other of said wheels, and wherein said cross bar includes a cross-bar connection means for connecting said cross-bar to said vehicle sprung frame assembly, said cross-bar connection means permitting rotation of said cross-bar about the longitudinal axis of said cross-bar.

b. a first junction means associated with said first arm, said first junction means including a first extension bar, a flexible joint for pivotally connecting said first arm to said first extension bar, and a connection means for rigidly connecting said extension bar to said associated housing section, and



c. a second junction means associated with said second arm, said second junction means including a second extension bar, a flexible joint for pivotally connecting said second arm to said second extension bar, and a connection means for rigidly connecting said extension bar to said associated housing section,

wherein forces applied by said first extension bar to said first arm are applied at a greater distance from said cross-bar longitudinal axis than are forces applied by said second extension bar to said second arm.

3,885,776

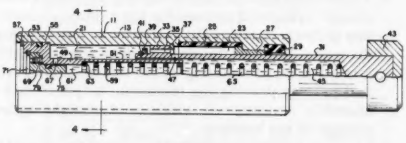
VARIABLE CUSHION SHOCK ABSORBER

Leland F. Blatt, 31915 Groesbeck Highway, Fraser, Mich. 48026

Filed May 8, 1974, Ser. No. 468,018

Int. Cl. B60g *11/56*

U.S. Cl. 267—34 **3 Claims**



1. A shock absorber comprising a body having a bore and a counterbore;

a piston having an axial opening and a plurality of bleed passages between said bore and counterbore;

said piston being movable within said bore and including a hollow piston rod extending through said counterbore and axially outward of said body, said rod having a plurality of radial ports between the piston opening and said counterbore;

an end cap on said rod adapted to be engaged by a moving mass toward the end of a longitudinal stroke;

a float valve in said bore movable upon said piston in registry with said passages closing same on retraction of said piston and opening said passages on forward return movement of said piston, permitting flow of liquid from said counterbore to said bore;

an axially apertured metering pin in said bore at one end having a head closing off and anchored within said bore, and adjacent thereto a transverse bleed passage between said bore and the aperture of the metering pin; the other

end of said metering pin extending into said piston and piston rod;

a coiled spring interposed between said metering pin and piston rod normally biasing said rod outwardly of the body;

an adjustable orifice element eccentrically mounted in said metering pin in registry with said transverse bleed passage to variably regulate fluid flow from said bore into said metering pin, said bore, metering pin, piston and piston rod being completely filled with liquid; whereby on retraction of said piston rod over said pin, displaced liquid from said bore passes through the metering pin into said piston and piston rod and through its radial ports to said counterbore;

said adjustable orifice element being sealed and rotatably adjustable in said metering pin head and having a valve element to variably regulate the size of a return chamber between said metering pin passage and metering pin bore, to provide for a preadjusted return flow of liquid into and through said metering pin;

and a sleeve of resilient foam plastic material nested in said counterbore, the liquid flowing into said counterbore compressing said sleeve, preloading the liquid in said counterbore, piston and metering pin.

3,885,777
LEVEL CORRECTOR FOR SHOCK ABSORBERS

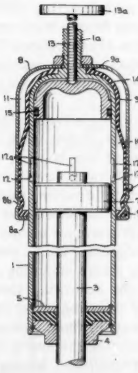
Christian Bourcier de Carbon, 64, Boulevard Maurice-Barres, 92-Neuilly-Sur-Seine, France

Continuation of Ser. No. 83,707, Oct. 26, 1970, abandoned. This application Dec. 29, 1972, Ser. No. 319,659

Claims priority, application France, Oct. 29, 1969, 69.37113

Int. Cl. F16f *5/00*

U.S. Cl. 267—64 R **5 Claims**



1. A variable-load shock absorbing suspension device capable of partially or completely suspending a portion of a vehicle on a wheel assembly, the device comprising an oleopneumatic shock absorber having a cylinder and a reciprocable damping piston therein, a rod on said piston extending outwardly of said cylinder through a packed opening provided at one end of said cylinder, a quantity of damping liquid within said cylinder within which said piston reciprocates, a quantity of compressible gaseous fluid separated by a partition from the quantity of damping liquid and exerting pressure on the damping liquid, a control piston disposed for fluid-tight reciprocation within said cylinder and being located at an end opposite said one end of said cylinder in pressure-exerting confining relation to the damping liquid and the gaseous fluid, and means on said cylinder for adjusting the position of said control piston to vary the pressure on the damping liquid and the gaseous fluid to proportionately vary the force of said rod to compensate for variations in load on the vehicle.

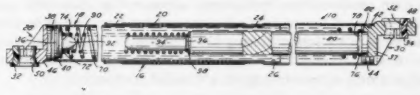
3,885,778
CLOSURE COUNTERBALANCE

Robert J. Deisenroth, Elkhart, Ind., assignor to Excel Industries, Incorporated, Elkhart, Ind.

Continuation of Ser. No. 265,334, June 22, 1972. This application Jan. 21, 1974, Ser. No. 434,921

Int. Cl. F16f *3/04*

U.S. Cl. 267—71 **5 Claims**



1. A counterbalance for a moveable closure on a structure, comprising first and second tubular members telescopingly connected together in sliding relationship, each of said members having abutment structure at the outer end thereof, a compression coil spring within said members, the end of said spring pressing against said abutment structures thereby urging said tubular members apart, the outer diameter of said spring being less than the inner diameter of either of the tubular members, an elongated rod within said tubular members in engagement at one end with the abutment structures of one of said members and extending into said spring in sliding contact therewith to guide same, said rod terminating short of the abutment structure of the other of said tubular members when said tubular members are telescoped together, a second compression coil spring positioned within said aforementioned coil spring, the ends of said second spring pressing against the inner end of said rod and the abutment structure of the other of said tubular members to aid the aforementioned spring in urging said tubular members apart upon initial expansion of the counterbalance to cause unassisted initial movement of the movable closure prior to counterbalancing thereof by the counterbalance.

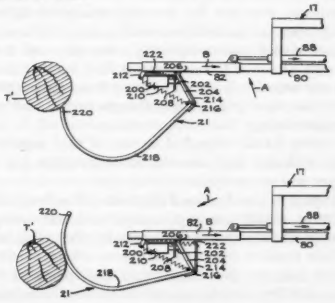
3,885,779
CONTROL MECHANISM

Donald P. Block, 147 Deerwood Dr., Orlando, Fla. 06231

Division of Ser. No. 248,221, April 27, 1972, Pat. No. 3,762,140. This application July 11, 1973, Ser. No. 378,086

Int. Cl. F16k *31/44;* **A01d** *75/28*

U.S. Cl. 251—229 **6 Claims**



1. An abutment responsive control mechanism for actuating a switch means having a switching element movable between an extended and a retracted position comprising: support means connected to and supporting said switch means and movable in at least two directions relative to the abutment, a lever supporting arm movably mounted on said support

means, a switch actuating lever movably mounted on said support means, an abutment contacting element rigid with said switch actuating lever and disposed in position to engage the abutment upon relative movement of the abutment and said support means, resilient means connected to said switch actuating lever for normally holding said lever supporting arm and said switch actuating lever in retracted position with the switch actuating lever bearing against and moving said switch element to its retracted position, contact of said abutment contacting element with the abutment when said abutment and abutment contacting element are relatively moving in one direction causing said switch actuating lever to move relative to said lever supporting arm and away from said switch means allowing the switching element to move toward its extended position, and relative movement between the abutment and said abutment contacting element in the opposite direction causing said switch actuating lever and said lever supporting arm to move away from said retracted position allowing the switch element to move to its extended position.

3,885,780

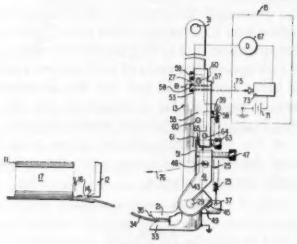
GRIPPER JAW INSERT MISTAKE DETECTOR

Wilbur J. Morrison, Nazareth, Pa., assignor to Bell and Howell Company, Phillipsburg, N.J.

Continuation-in-part of Ser. No. 62,912, Aug. 11, 1970, Pat. No. 3,744,787. This application Jan. 22, 1971, Ser. No. 108,900

Int. Cl. B65h *43/02*

U.S. Cl. 270—56 **10 Claims**



1. A mistake detector for inserting machines utilizing at least one gripper jaw assembly movable toward and away from an insertion station and comprising a first jaw and a second jaw rotatably attached to one another in a manner such that said jaws are rotatable toward and away from each other so as to form an insertion gripping gap therebetween, said mistake detector comprising:

a leaf spring fixedly attached to one of said jaws so as to rotate with said one jaw relative to the other jaw of said gripper jaw assembly;

spaced apart first and second electrodes fixedly attached to the other of said jaws a portion of said leaf spring lying between said electrodes and normally occupying an intermediate position between said electrodes whereby rotation of said one jaw causes said leaf spring to contact either said first or said second electrode depending upon the number of inserts being gripped by said gripper jaw assembly; and,

an electronic detector and indicator means electrically connected to said electrodes and to said leaf spring for detecting and indicating when one of said electrodes is in contact with said leaf spring by completing an electrical circuit which includes said electrodes and said leaf spring.

3,885,781

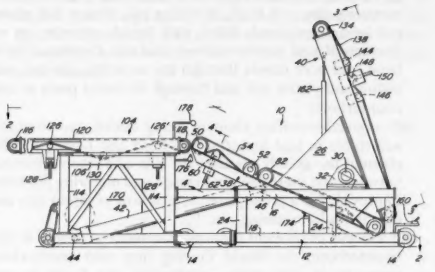
APPARATUS FOR SHINGLING FLAT SHEETS

Charles H. Krebs, Lindenwold, N.J., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed June 13, 1973, Ser. No. 369,634

Int. Cl. B65h *1/30*

U.S. Cl. 271—3.1 **13 Claims**



1. Apparatus for shingling sheets from a stack comprising a frame,

a V-shaped shingling conveyor rotatably supported by said frame,

said shingling conveyor having first and second conveyor supports disposed at an acute angle to each other,

said first conveyor support having a conveyor thereon for moving a stack of sheets toward the plane of said second conveyor,

said second conveyor support having a conveyor thereon for moving sheets away from the plane of said first conveyor support,

motor means for driving said conveyors, and

means for pivoting said shingling conveyor about a transverse horizontal axis from a stack receiving position to a discharging position wherein sheets from the stack lean in the direction of discharge on said second conveyor support and are consecutively discharged in shingled relationship.

13. Apparatus comprising a feed table for feeding sheets, said table having a hopper, means for feeding sheets one at a time from the bottom of the hopper, conveyor means for feeding sheets into the hopper, level control means for said hopper including means for disabling said feeding means until a predetermined number of sheets are in the hopper and means for disabling said conveyor means when the number of sheets in said hopper is greater than a predetermined number of sheets, said conveyor means including an outfeed conveyor, a shingling conveyor for delivering shingled sheets to said outfeed conveyor, said shingling conveyor including first and second conveyor supports inclined with respect to each other at a fixed angle and pivotable about a transverse horizontal axis, and each conveyor support having conveyors thereon, said second conveyor support being inclined upwardly toward said outfeed conveyor in the discharge position of the shingling conveyor for feeding sheets to said outfeed conveyor, and means associated with the conveyor on said second conveyor support for moving the sheets therealong at progressively faster speeds toward said outfeed conveyor.

3,885,782

SHEET FEEDER

David D. Wright, Vershire, Vt., and Ivor Hawkes, Lyme, N.H., assignors to Xerox Corporation, Stamford, Conn.

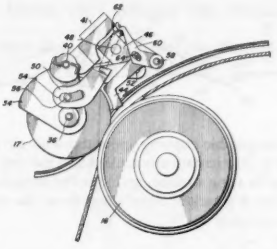
Filed Dec. 6, 1973, Ser. No. 422,385

Int. Cl. B65h *3/52*

U.S. Cl. 271—10 **2 Claims**

1. In an apparatus for separating and feeding individual sheets of material from a stack of sheet material including separator means adapted for engagement with one sheet in the

stack to separate the sheet from the stack, feed means adjacent said separator means for engaging and feeding the separated sheets away from the stack, a retard roll adapted for cooperation with said feed means, drive means adapted to rotate said retard roll in a direction to return excess separated sheets to the stack of sheet material; and slip means associated with said drive means and said retard roll adapted to allow said retard roll to rotate in a feed direction when a single sheet is present between said retard roll and said feed means, the improvement comprising:



sheet sensing means adapted to sense the presence of a sheet between said feed means and said retard roll, said sheet sensing means being adapted to momentarily deenergize said feed means to allow time for said retard roll to return excess separated sheets to the stack; and,

lift means adapted to move said retard roll out of engagement with said feed means after the excess sheets have been cleared from between said retard roll and said feed means to remove the drag on the sheet being forwarded by said feed means.

3,885,783

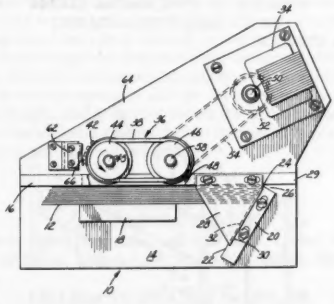
DOCUMENT FEEDER

Carl E. Anderson, Des Plaines, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed July 2, 1973, Ser. No. 375,734

Int. Cl. B65h *3/04*

U.S. Cl. 271—34 **4 Claims**



1. A document feeder for separating and advancing a single document at a time from a supply of documents comprising:

a hopper for holding a supply of documents standing on edge to be fed, said hopper including a document guide assembly comprising a guide plate, a movable gate member and a fixed guide element for restraining the lower and upper edges of said document respectively, said guide assembly being angularly disposed in relation to said guide plate causing the lead edges of said documents to be offset from one another in a direction extending into the interior of said hopper to form an exitway therebetween, said exitway having a width large enough to permit the passage therethrough of a single document at a time;

an endless belt member positioned adjacent said guide plate and having access to the face of a forward-most document to be fed from the supply of documents, said endless belt having raised finger elements on a portion of its outer periphery for engagement with the face of the document to be fed;

drive means for driving the endless belt in a predetermined path into and out of engagement with the face of the document being fed during each revolution of the endless belt;

switch means in the path of said belt identifying a start position for said belt in said path to provide finger contact with said document for a period of time to assure removal of said document from said hopper during the period said belt completes one revolution and stopping the operation of the belt when said finger returns to said start position; whereby movement of the finger elements into engagement with the face of the document during each revolution advances one document at a time from said supply.

3,885,784

DOCUMENT SINGLING ARRANGEMENT

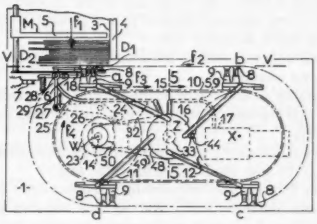
Guy Sautton, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 19, 1973, Ser. No. 417,089

Claims priority, application France, Jan. 27, 1971, 71.02623; Sept. 14, 1973, 73.33137

Int. Cl. B65h *3/08*

U.S. Cl. 271—94 **10 Claims**



1. Mechanism to assure the one by one separation and the putting in series at a constant interval of documents from a stack of documents, comprising:

a hopper that contains this stack of documents and presents them to be picked up,

a preseparation element intended to separate the first document from the rest of the documents in said hopper and hold it in the pickup position,

mobile suction means to pick up the first document presenting itself in pickup position and to make it advance to the end of the advancement path, said suction means comprising:

conveyor means to which are attached a plurality of evenly spaced suction cup carrier units,

at least two pulleys on which said conveyor means travels, the documents being conveyed around the arc of at least one of the pulleys, said pulleys having shafts whereof one is driven by motor means, and

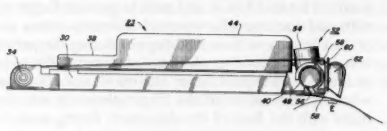
a distributor to supply a vacuum to the suction cup carrier units, said distributor being connected to the vacuum source by two distinct conducts, one of which is used to supply a vacuum to the suction cup carrier units presenting themselves in the pickup position and the other is used to supply a vacuum to the suction cup carrier units starting from a position located between the pickup position and the passage around the pulley to the position of the end of the path, said distributor further connecting

said suction cup carrier units to atmospheric pressure when they reach said end of path position.

3,885,785
VACUUM TRANSPORT

Robert A. Burkett, Fairport, and Daniel S. Hoffman, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1973, Ser. No. 426,977
Int. Cl. B65h *29/56*
U.S. Cl. 271—174 **3 Claims**



1. In a reproduction machine wherein a transfer member is electrostatically tacked to a moving image support member, a vacuum transport for removing the transfer member from the image support member and transporting the transfer member away from the support member including:

a frame member;

a plurality of small diameter rolls in axial alignment mounted on one end of said frame member forming a first roller assembly, the axis of said rolls being disposed parallel to the leading edge of said transfer member adjacent said support member;

a second roller assembly mounted on said one end of said frame member, the roller axis of said second roller assembly being disposed parallel to and spaced from the axis of said small diameter rolls;

a third roller assembly mounted on the other end of said frame member;

a plurality of endless perforated belts operatively mounted in said transport for movement around said roller assemblies;

means for forming first vacuum ports immediately behind each of said small diameter rolls; and,

means forming second vacuum ports between each of said small diameter rolls, said second vacuum ports being positioned adjacent said support member and parallel to the leading edge of said transfer member, movement of said transfer member on said support member adjacent said small diameter rolls causing said transfer member to be separated from said support member by the flow of air through said first and second vacuum ports for engagement with said belts and movement by said belts away from said support member.

3. In a reproduction machine wherein a transfer member is electrostatically tacked to a moving image support member:

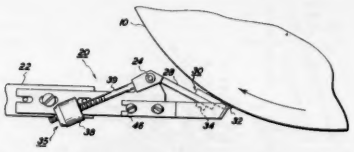
a transport for removing the transfer member from the image support member and transporting the transfer member away from the support members; and,

a corona emission device located adjacent said transport for spraying the transfer member with charged ions, said corona emission device including shield means adapted to direct the charged ions onto a limited area of the transfer member, said limited area being that area on the transfer member between the point on the image support member whereat the transfer member is separated from the image support member and the point at which the transfer member is contacted by said transport, the shield means thereby directing ions only on the area of the transfer member which is unsupported in the space between said image support member and said transport to provide optimum stripping of the transfer member from the image support member while assuring optimum copy quality resulting from the charge produced on the transfer member by said corona emission device.

3,885,786
STRIPPER FINGER

Herbert F. Schmalzbauer, Chester, Conn., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 247,064, April 24, 1972, abandoned. This application Apr. 25, 1973, Ser. No. 354,551
Int. Cl. B65h *29/56*
U.S. Cl. 271—174 **2 Claims**



1. In a xerographic copying apparatus wherein an insulating copy sheet is electrostatically tacked to a moving xerographic drum image bearing surface, an improved stripping apparatus for removing the tacked copy sheet from the moving drum surface comprising

a frame,

a support member mounted about a pivot axis on said frame,

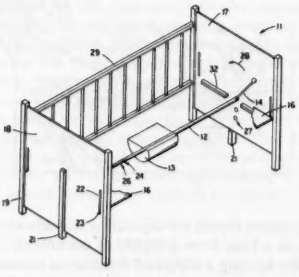
an elongated finger member mounted on said support member extending tangentially to the drum surface with its tip portion extending a predetermined extent beyond the point of tangency,

counterweight means mounted on said support member on a side of said pivot axis opposite said finger member to urge said finger member into low pressure riding contact with the drum surface whereby the copy sheet is stripped from the drum surface at very low compressive stresses, wherein the support member is formed with a counterbore opening about the pivot axis to present a minimum of pivot bearing surface to effect self aligning of the finger member at the line of contact with the drum surface.

3,885,787
MOVABLE PLATFORM AMUSEMENT DEVICE FOR A CHILD

Jeff B. Walker, 131 Berkley Rd., Indianapolis, Ind. 46208

Filed Jan. 21, 1974, Ser. No. 434,864
Int. Cl. A63g *31/02*; **A47d** *9/02*
U.S. Cl. 272—1 R **5 Claims**



1. An amusement device for a child comprising:

a rod, mountable below a child's enclosure which has a raised movable bottom platform;

a platform-deflecting member rigidly attached to the rod and having a varying radial dimension measured from the axis of the rod;

a handle rigidly attached to the rod and extending beyond the platform-deflecting member; and

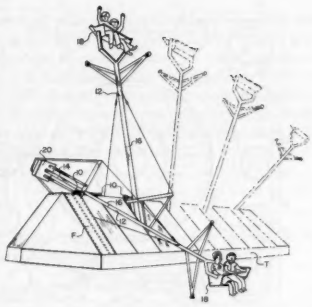
a child's enclosure which has a raised movable bottom platform, the rod being rotatably mounted below the platform, and wherein the platform-deflecting member is sized to contact the platform when the rod is rotated, whereby the platform is deflected upwardly a distance dependent upon the radial dimension of the member at its point of contact with the platform.

3,885,788

JUMP-OVER AMUSEMENT RIDE

Richard A. Harris, 1027 Jefferson Rd., Greensboro, N.C. 27403

Filed Oct. 12, 1973, Ser. No. 406,027
Int. Cl. A63g *11/00*
U.S. Cl. 272—55 **5 Claims**



1. A jump-over amusement device comprising a horizontally extending axle supported at a prescribed distance above a ground or support surface, a beam pivotally mounted to said axle at a point closer to one end of said beam than the other end, the distance between said axle and said one end being less than the distance between said axle and said support surface, the distance between said axle and said other end being greater than the distance between said axle and said support surface, a rider support means attached to the free end of the longer end section, a counterweight slidably mounted on the shorter end section, a fluid cylinder and piston means having the free end of the piston thereof connected to said counterweight for moving said counter-weight along said shorter end section between a non-operative position where said counterweight is nearest said axle and an operative position further from said axle, and a control means for activating said fluid cylinder means, said control means located at a position remote from said shorter end section.

3,885,789

EXERCISING DEVICE

Michael E. Deluty, Brookline, and Morton A. Levine, Belmont, both of Mass., assignors to Michael E. Deluty, Brookline, Mass.

Filed June 21, 1974, Ser. No. 481,907
Int. Cl. A63b *21/02*
U.S. Cl. 272—83 A **13 Claims**

6. An exercising device comprising:

a. a housing having a hollow interior and a cord opening;

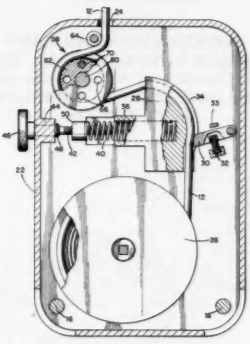
b. a cord retractor reel mounted for rotation within said housing;

c. rewind means for continuously urging said retractor reel in the rewind direction;

d. a capstan mounted within said housing, said capstan being fixed against rotation in the unwind direction in its operative mode;

e. a flexible cord fixed to and wrapped around said retractor reel, said cord running from said reel to and being wrapped at least one full turn around said capstan, said cord running from said capstan out of said housing through said cord opening; and

f. manually adjustable variable resistance friction nip means mounted within said housing between said cord retractor reel and said capstan for applying frictional force to said cord, said friction nip means including a support member contacting one side of said cord, a pivoted jamming arm mounted on the other side of said cord, resilient means for continuously urging the free end of said pivoted jamming arm in the unwind direction against the other side



of said cord to frictionally wedge said cord between said support member and said jamming arm as said cord is pulled out of said housing, said jamming arm pivoting in the rewind direction to unwedge said cord as said cord is retracted into said housing;

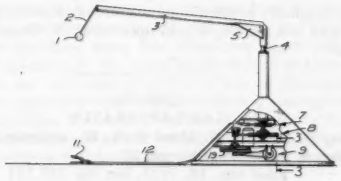
g. said rewind means, said capstan, and said variable resistance friction nip means all cooperating to apply force to said cord to oppose an exteriorly applied manual force pulling said cord in the unwind direction, said friction nip means releasing force on said cord, and said rewind means retracting said cord in the rewind direction in the absence of an exteriorly applied manual force on said cord.

3,885,790

PITCHING MACHINE

Lee Roy Parr, 131 Berkley Rd., Rialto, Calif. 46208

Filed June 18, 1973, Ser. No. 371,153
Int. Cl. A63b *69/40*
U.S. Cl. 273—26 E **3 Claims**



1. A fully automatic centrifugal baseball pitching machine comprising the combination of:

a. a base;

b. A vertical shaft mounted on said base and having a horizontal arm attached to its upper end,

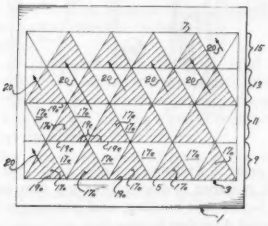
c. a tether line having a baseball attached to one of its ends and having its other end extending through said horizontal arm and vertical shaft,

d. a retracting spool mounted to said base;
e. said retracting spool engaged with said other end of said line;
f. a rotational drive means engaged with said retracting spool to maintain a positive pressure on said line to remove any slack in the line;
g. a friction slip clutch mounted between said rotational drive means and said retracting spool to permit the retracting spool to rotate relative to said friction slip clutch when said ball is hit with a predetermined force;
h. drive motor mounted to said base and connected to said vertical shaft to impart rotation to said shaft. horizontal arm and baseball.

3,885,791
BOARD GAME APPARATUS

Jean-Yves Chouinard, 81 St. Louis St. Apt. 3, Quebec G1R 3Z4, Quebec, Canada

Filed June 3, 1974, Ser. No. 476,059
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 K **3 Claims**



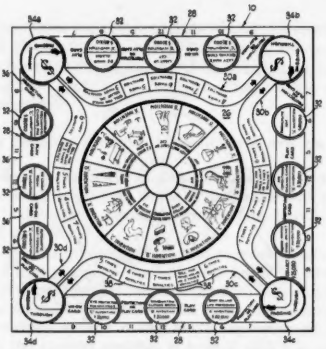
1. A game comprising a game board and playing pieces, said game board having a playing surface positioned between a pair of parallel opposite sides and divided into four rows designating different phases of the game and arranged in spaced parallel relationship relative to each other and to said opposite sides, each of said rows including a first series of an odd number of triangles and a second series of an even number of triangles interposed between said triangles of the first series and having their base facing toward the other of said sides, the first series of triangles in the row adjacent each of said sides having their bases aligned along the corresponding side and including a center triangle defining a laterally centered goal place triangle, said playing pieces including two distinct sets each having a number of distinct playing pieces equal to the total of said odd and even numbers of triangles in one row, and originally positioned on the triangles of the one of said rows which is adjacent one of the sides, and each of said two distinct sets including a single goal marking playing piece originally positioned on one of said centered goal place triangles and marking a goal upon reaching the other of the latter.

3,885,792
GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 10, 1973, Ser. No. 387,521
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 C **4 Claims**

1. A board game comprising:
a gameboard having a playing surface thereon;
a plurality of playing pieces;
simulated money;
a set of patent cards each having indicia representative of a patented invention and indicating the possible scope of protection in the form of the number of claims and the expected financial return of said patent in the form of its purchase price and royalties corresponding to and increasing with the number of claims;
a set of protection cards each having indicia thereon which dictates how many claims a patented invention has, said protection cards being acquired during the course of the game;
a plurality of stations defining a main playing piece path of travel including patent stations having indicia thereon representative of a patented invention corresponding to the patented inventions represented by the patent cards, said patent cards being acquired by expending said simulated money should a player's playing piece land on that particular patent station, and protection stations having indicia thereon which allow a player to pick a protection card should its playing piece land on a protection station, said main path also including at least one entrance station



and at least one exit station defining stations where a playing piece may be moved on or off the main path;
means defining a secondary playing piece path of travel on said playing surface connected to said main path, said secondary path comprising a plurality of stations including and overlapping with an entrance station wherein said secondary path begins and an exit station wherein said secondary path ends, whereby a playing piece may be able to move onto said secondary path only when it is advanced onto said entrance station, said secondary path also including cash stations having indicia thereon representative of a financial return on a patented invention, said financial return being the amount of royalties for the price indicated by a patent card corresponding to the number of claims obtained for that patent; and
a chance device for determining how many stations a particular playing piece is to be advanced along said paths.

3,885,793
PUZZLE DEVICE

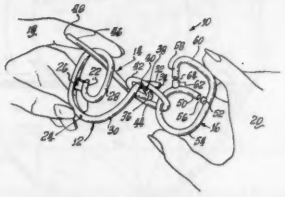
Eldon D. Vaughn, 212 S. Kraemer, No. 1908, Placentia, Calif. 92670

Filed Mar. 22, 1974, Ser. No. 453,583
Int. Cl. A63f *9/08*
U.S. Cl. 273—158 **6 Claims**

1. A puzzle device comprising:
first and second self-contained elements, each being formed of substantially rigid wire-like material of substantially uniform cross-section in scroll-like configuration;
the configuration of each of said elements having a first end curved as an inwardly convoluted spiral into an inner loop with said first end disposed adjacent a portion of said inner loop, said inner loop thereafter merging into an outer loop, said outer loop thereafter merging into a

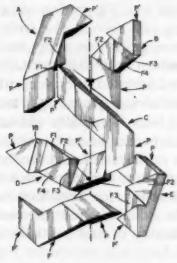
substantially elongate tail terminating at a second end of said element configuration;

web means disposed between said first end of said configured first element and said adjacent portion of said inner loop of said first element to define a restriction therebetween to deny passage of the cross-section of said second element, said web means having a portion of less thickness than said first element,



said first end of said configured second element being disposed relative to said adjacent portion of said inner loop of said second element to form an open gap span dimensionally less than that of the cross-section of the material of said first element but great enough to accommodate said restriction thereof with clearance to enable said restriction to pass through said open gap span by hand manipulation of said elements.

3,885,794
PUZZLE
Stewart T. Coffin, Old Sudbury Rd., Lincoln, Mass. 01773
Filed May 18, 1973, Ser. No. 361,568
Int. Cl. A63f *9/12*
U.S. Cl. 273—160 **5 Claims**



1. A family of at least two three-dimensional puzzles, each puzzle having six identical pieces, each piece comprising:

a pair of members, each member defining a prismatic shape of equilateral triangular cross-section;

said members being arranged so that their longitudinal axes are askew, and with a longitudinal edge line of one of said prismatic members substantially intersecting a longitudinal edge line of the other of said prismatic members at an angle of approximately 109.5°;

said prismatic members being oriented so that their surfaces which are opposite their intersecting edges are substantially parallel to each other;

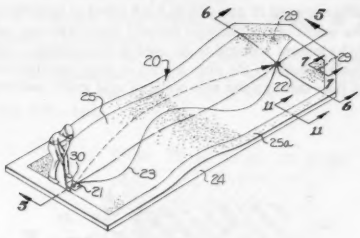
an intermediate member connecting said prismatic members to secure said prismatic members together, said intermediate member having selected surfaces which are engageable with corresponding surfaces of intermediate members of the other pieces of said puzzle to facilitate orientation and mating of said puzzle pieces with each other;

each intermediate member of each piece of each of said puzzles being substantially identical in shape and each piece of each of said puzzles being of the same dimensional scale, the pieces from each of said puzzles being interchangeable with the pieces of the other of said puzzles;

the ends of each of the prismatic members in the pieces of a particular puzzle being cut off along the planes defining an oblique angle with the axis of said prismatic member; and

the ends of the prismatic members in the puzzle pieces of one of said puzzles being cut off along oblique planes which are different from the oblique planes along which the ends of the prismatic members of other pieces of the other puzzles in said family are cut off.

3,885,795
GOLF BALL PUTTING GAME
Walter E. Brewer, 524 Clarendon Pl., Rock Hill, S.C. 29730
Filed Jan. 28, 1974, Ser. No. 437,489
Int. Cl. A63b *69/36*
U.S. Cl. 273—176 E **3 Claims**



1. A putting game characterized by providing a challenging and interesting test of skill both to experienced and unexperienced players, and wherein the playing ball is adapted to travel a difficult to predict generally serpentine path upon being stroked, said game comprising a golf putter, a playing ball of oval, generally egg-shaped configuration adapted to travel an erratic path curving generally in the direction of the smaller end when stroked with the putter, and a playing course along which the oval playing ball is to be stroked during the play of the putting game, the playing course comprising a plurality of putting holes positioned adjacent one another and arranged in a series for being successively played, each putting hole comprising an elongate slab of a length and width sufficiently large to permit a person playing the putting game to walk thereon and having an undulating contoured upper playing surface over which the oval playing ball may travel during play of the game, each putting hole having means defining a teeing area adjacent one end thereof from which the oval playing ball may be initially stroked, cup means located adjacent the opposite end thereof at a distance from the teeing area and adapted for receiving the oval playing ball therein, and means extending along said undulating upper playing surface for substantially the entire length thereof and serving to delineate on said playing surface a pair of side-by-side visually distinguishable longitudinally extending scoring zones of different values, with such different valued scoring zones coupled with the erratic path of travel of the oval playing ball serving to enhance the challenge and test of skill of the game.

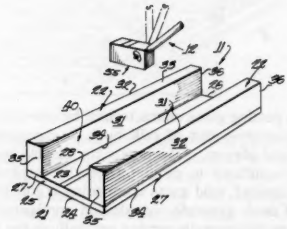
3,885,796
GOLF PUTTING PRACTICE APPARATUS
Verne W. King, Sargent, Nebr. 68874
Filed July 5, 1974, Ser. No. 486,181
Int. Cl. A63b *69/36*
U.S. Cl. 273—186 C **1 Claim**

1. An improved practice device for training in establishing correct putting technique and in the development of the cor-

rect putting stroke in the game of golf, said device comprising, in combination:

A guide member having a generally U-shaped crosssection adapted to be supported on the ground, said guide member being defined by a flat rectangularly shaped base having a flat top surface and a flat bottom surface with opposed front and back edges and opposed parallel side edges, the guide member further including identical side rails having top, bottom and back surfaces with a flat interior vertical surface and opposed end edges, each said side rail associated with one of the base side edges and extending therealong with the side rail bottom surface being supported upon the base top surface, the guide member further defining a pair of transversely extending slots associated with each of the side edges and disposed adjacent opposite end edges of the base member, each slot extending completely through the base member with the guide member further including fastening means associated with each said slot and extending therethrough to engage the associated side rail through the bottom surface thereof each of the side rails being adjustably movable transversely of the base member in a direction either toward or away from each other to selectively vary the width of the channel defined therebetween; and

a club element adapted to be used in combination with said guide member, the club having a head member adapted to pass through the side walls of said guide member and



including a shaft extending from the head member and adapted to be gripped by the user for use in guiding the movement of the head member, the club being defined by an elongated shaft having a gripping portion at the top terminal thereof and a block shaped rectangular club head having substantially parallel top and bottom surfaces and parallel side surfaces disposed normal to the top and bottom surfaces, the club further defining an opening extending through the head adjacent one corner thereof and being defined between the top surface and one of the side surfaces, the club head including an aperture extending through the terminal end of the shaft normal to the axis of the shaft and adapted to receive a bolt to pass through the club head hole and aligned shaft aperture to pivotally secure the shaft to the club head, the club further being defined by a fastening means threadibly adjustably received on the bolt to permit adjustment of the angle of the club head with respect to the axis of the shaft; and

a first indicia extending along the central axis of the base member of the top surface thereof between opposite end edges thereof and a second indicia disposed on the top surface of the club head intermediate the side surfaces thereof and extending in a direction normal to the front and back surfaces thereof said second and first stripes being identical in general configuration and adapted to the aligned in use for training purposed.

3,885,797

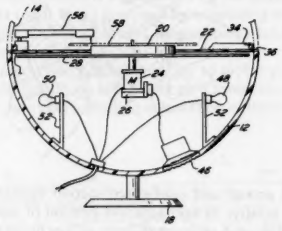
PHONOGRAPH

Donald J. Booty, and Charles F. Vandervelde, both of Frankfort, Ill., assignors to LCA Corporation, Philadelphia, Pa.

Filed Oct. 3, 1973, Ser. No. 402,933

Int. Cl. G11b *1/04*

U.S. Cl. 274—2 **4 Claims**



1. A phonograph in combination with an opaque housing having a removable cover, a rotatable turntable horizontally supported by said housing for rotation about a vertical axis and adapted to support a phonograph record, motor means supported by said housing for rotating the turntable at different selected speeds, first and second discs, said first disc being on said housing horizontally disposed adjacent the plane of said turntable, said discs having an outer diameter greater than the outer diameter of said turntable, said first disc being annular and stationary, said first disc having a centrally disposed hole through which a portion of said turntable extends, means for rotating said second disc with said turntable at the same speed, a phonograph arm supported by said housing and movable to a position over said turntable for contact with a phonograph record adopted to be supported by said turntable, each of said discs having spaced light transmitting zones in a portion thereof which is radially outwardly from the outer periphery of said turntable and which partially overlap at different rotative positions of said second disc, said zones on at least one of said discs being multicolored, and illuminating means in said housing for simultaneously projecting light upwardly from the housing about the periphery of the turntable through a plurality of said partially overlapping zones on said discs.

3,885,798

DRIVE ASSEMBLY FOR PHONOGRAPH RECORD PLAYER

Kunio Yokokura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 25, 1974, Ser. No. 454,776

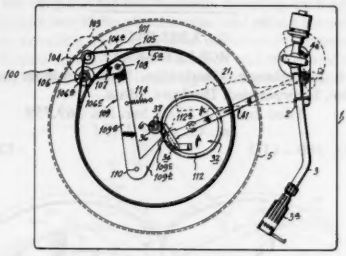
Claims priority, application Japan, Mar. 29, 1973, 48-38065

Int. Cl. G11b *17/06, 3/60*

U.S. Cl. 274—10 R **14 Claims**

1. In a phonograph record player having a frame, a turntable rotatably mounted on said frame for supporting a phonograph record during the playing thereof, and a function control mechanism driven by rotation of said turntable in response to actuation of said control mechanism; a drive mechanism for said turntable comprising an electrical motor, a first transmission means connecting said motor with said turntable for rotating said turntable during the playing of a phonograph record thereon, and a second transmission means made operative upon actuation of said function control mechanism for

further connecting said motor with said turntable and for driving said turntable from said motor so as to prevent slowing

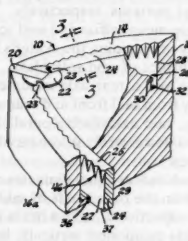


of the rotation of said turntable when said turntable drives said control mechanism.

3,885,799
SEALING ASSEMBLY

William H. Bibbens, 16500 N. Park Dr., Southfield, Mich. 48075

Division of Ser. No. 312,408, Dec. 5, 1972, Pat. No. 3,851,999.
This application June 20, 1974, Ser. No. 481,567
Int. Cl. F01c *19/00*
U.S. Cl. 277—81 P **48 Claims**



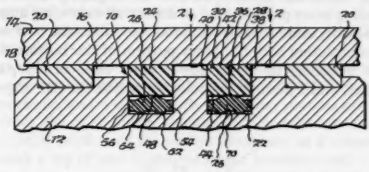
1. A sealing assembly comprising: a first seal supporting member having an end face; a groove formed in said end face; a sealing strip received in said groove an outer portion of which projects axially from said groove and is adapted to engage a surface of a second member spaced from said end face and movable with respect thereto; and interengageable force transmitting means on said sealing strip and seal supporting member operable in response to friction forces on said outer portion to apply transverse and axial reaction forces on said sealing strip in directions to simultaneously urge said sealing strip into sealing engagement with one side wall of said groove and to project further axially outwardly from said groove.

3,885,800
SEAL RING SYSTEM

Ward Sievenpiper, Milgrove, N.Y., assignor to A-T-O Inc., Willoughby, Ohio

Continuation of Ser. No. 353,532, April 23, 1973, abandoned.
This application Dec. 28, 1973, Ser. No. 429,186
Int. Cl. F16j *9/06*
U.S. Cl. 277—165 **20 Claims**

1. A sealing ring system comprising: an annular outer member of non-deformable material adapted to be received in a peripheral groove formed in a reciprocating member in spaced relation to the bottom wall of said groove; an annular inner expander member adapted to be received in said groove between said groove bottom wall and said outer member for urging the latter into pressure sealing engagement against the surface to be sealed; said expander member being formed of a material providing relatively high resistance to axial deformation and having an irregularly shaped outline in cross sectional configuration defining a peripheral bead on one surface thereof and a pair of axially spaced inner peripheral ribs on

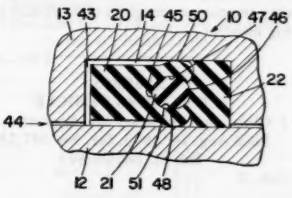


the other surface in sealing engagement with said outer member and said groove bottom wall surface, respectively, to impart a relatively light radial loading on said outer member under static sealing conditions.

3,885,801
PACKING

John B. Scannell, Long Beach, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 201,018, Nov. 22, 1971, abandoned.
This application May 15, 1974, Ser. No. 470,205
Int. Cl. F16j *15/32, 9/00*
U.S. Cl. 277—165 **3 Claims**



1. A sealing arrangement including two telescoped members, one of said members having a groove therein with a bottom wall radially opposite the other member, the groove having opposed end walls, one of said end walls having an axially projecting annular portion of less radial thickness than said groove, said one end wall being shaped to provide an annular space on each side of the projecting portion, a sealing assembly within said groove and comprising a sealing ring and a loading ring, the sealing ring comprising a body having inner and outer lips extending from one end thereof and defining an annular groove therebetween with an open end of substantially the same width as said projecting portion, each lip having a free end, said loading ring being within and initially substantially filling said annular groove and having an exposed end engageable with said projecting portion, said exposed end being initially substantially flush with the free ends of said lips, and said sealing and loading rings being made of deformable materials whereby upon fluid pressure being applied to the assembly from the other end of said body said projecting portion will enter the annular groove to deform the loading ring and sealing ring while confining the loading ring completely within said annular groove, and said lips will enter said spaces.

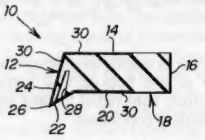
3,885,802
PACKING MEMBER FOR AUTOMOBILE LIFT

John H. Wheeler, 3921 Marquette St., Dallas, Tex. 75225

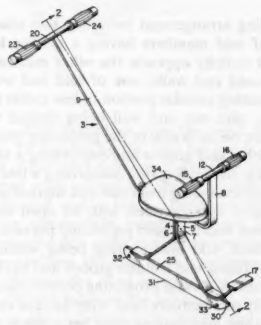
Filed Oct. 4, 1973, Ser. No. 403,527
Int. Cl. F16j *15/32*
U.S. Cl. 277—212 **10 Claims**

1. A packing member comprising an annular body of elastomeric material having a substantially radially disposed top

wall, a substantially axially disposed outer wall extending downwardly from the top wall, a bottom wall including a substantially radially disposed outer portion extending inwardly from the outer wall and an angularly downwardly extending inner portion, and an inner wall extending angularly downwardly and inwardly from the top wall to the bottom wall and intersecting with the inner portion of the bottom wall to define a sealing lip at the lower inner edge of the packing member, and a plurality of holes formed in the packing member at spaced points around the inner portion of the bottom wall, all of said holes extending into the packing member substantially axially and through a substantial portion of the distance between the top and bottom walls, said holes for permitting the packing member to distribute itself more uniformly during the use of the packing member and thereby form a more effective seal, for reducing stress concentrations and thereby reducing wear, and for accommodating eccentricities between the component parts of a cylinder incorporating the packing member.

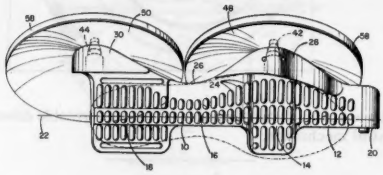


3,885,803
ICE SKATING VEHICLE
Anthony J. Christian, 100 Parker Rd., Rochester, N.Y. 14617
Filed Aug. 10, 1973, Ser. No. 387,259
Int. Cl. B62b *13/18*
U.S. Cl. 280—8 **2 Claims**



1. An ice-skating device having structure comprising,
a. a pair of handles to propel said device, said handles extending rearwardly and upwardly from a central portion of the structure with rigid means positioning said handles substantially clear of said central portion;
b. said central portion of said structure comprising a two-section framework having a base and a leveled top;
c. a single runner of length and characteristics comparable to an ice-skate runner with sharp edges and tapered ends, said runner permanently attached underneath the base portion of said two-section framework;
d. a seat for a rider positioned on said leveled top portion of said two-section framework;
e. rider's handles extending upwardly from the top of said framework at the front end of the rider's seat;
f. and rider's footrests extending upwardly and forwardly from the base portion of said combined two-section framework.

3,885,804
ROLLER SKATE
Patrick J. Cudmore, Cambridge, Mass., assignor to Wane-Rider, Incorporated, Duxbury, Mass.
Filed June 13, 1973, Ser. No. 369,759
Int. Cl. A63c *17/14*
U.S. Cl. 280—11.2 **12 Claims**



1. A roller skate comprising:
a. a sole plate having a ball portion and a heel portion on its upper surface to accommodate the corresponding parts of a skater's foot or shoe thereon, said sole plate having rigid front and rear axle mount portions along its outer margin at locations laterally aligned with said sole plate ball and heel portions, respectively;
b. foot engaging means affixed to said sole plate for gripping and securely maintaining the skater's foot or shoe against the upper surface of said sole plate;
c. a front axle and a rear axle mounted in and extending downwardly from said front and rear axle mount portions, respectively, said axles being parallel to each other and being angled downwardly in excess of 28° with respect to the horizontal;
d. a front wheel and an equal diameter rear wheel mounted for rotation on the outer ends of said front axle and said rear axle, respectively, said wheels having ground contacting points positioned vertically beneath the approximate front to rear center line of said sole plate and
e. a toe stop mounted on the front end of said sole plate, said top stop extending forward of said front wheel periphery;
f. the point of intersection of the axis of said front wheel axle with the plane of said front wheel periphery being located in a horizontal plane which is above the upper surface of said sole plate ball portion;
g. the point of intersection of the axis of said rear wheel axle with the plane of said rear wheel periphery being located in a horizontal plane which is below the upper surface of said sole plate heel portion;
h. said front wheel periphery and said rear wheel periphery being spaced apart at their points of closest proximity by a distance which is less than 10% of the combined diameters of said wheels.

3,885,805
SKI INSTRUCTIONAL DEVICE
Frank Solymosi, 255 Violet St., Massapequa Park, N.Y. 11762
Filed Apr. 5, 1973, Ser. No. 348,129
Int. Cl. A63c *5/06*
U.S. Cl. 280—11.13 H **2 Claims**

1. In a ski-instructional device for use with a pair of skis and a pair of ski poles, the combination comprising:
a. a pair of attachments, each attachment being adapted to be mounted upon the upper surface of a different one of the skis at a location where the curvature of the tipe of the ski is substantially tangential to the remainder of the ski, each said attachment comprising a cupped-shaped receiver positioned on said skis with the opening of the

cupped-shape facing upwardly, the surface of the interior of the cupped-shape having a slot; and

b. means adapted to be mounted on the lower end of each of the ski poles for mechanically coupling each pole to a different one of the attachments, said means for mechanically coupling each pole to a different ski comprising a T-shaped tip attached to the lower end of each of said ski poles, said T-shaped tip being insertable into said slot to

bear against the attachment and when turned at an angle to the slot engaging the edges of the slot whereby said mechanical coupling means enables the skier to transmit both upwardly and downwardly extending forces through the ski poles to the tips of the skis, whereby the coupling means when engaged with the attachments enables the skier to vary the weight on the forward portion of the skis by forces transmitted through the ski poles.

3,885,806

NESTABLE STROLLER

Antoine Trubiano, Montreal East, Quebec, Canada, assignor to Cari-All Inc., Montreal East, Quebec, Canada

Filed June 17, 1974, Ser. No. 480,158
Int. Cl. B62b *7/00, 11/00*
U.S. Cl. 280—33.99 B **3 Claims**

1. A nestable stroller construction comprising;

a frame member supported on wheel means for permitting movement of the stroller;

said frame member comprising a horizontally disposed U-shaped shelf support member at the bottom of said stroller, the closed part of the U-shaped member being at the front end of said stroller and comprising the front end of said U-shaped member, the legs of said U of said U-shaped member sloping outwardly away from each other from the front end to the back end of said U-shaped member;

upright members extending upwardly from each leg of the U at the back end of said U-shaped member, each said upright member comprising a forwardly extending bottom portion connected, at the bottom ends thereof, to their respective legs of said U and extending upwardly and forwardly from the respective leg, a central portion, extending upwardly from said forwardly extending bottom portion, and a rearwardly extending handle portion extending upwardly and rearwardly from said central portion and terminating in a free end;

the free ends of said handle portions being joined by a handle;

forwardly extending seat support members comprising a semi-circular like portion having upper and lower arcuate sections, and a downwardly extending portion extending from the said lower arcuate section adjacent the said central portion of the upright members to a connection with a leg of said U-shaped frame member; and

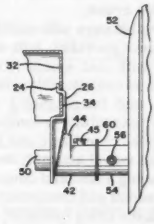
seat means suspended from said seat support members for holding a child including a leg receiving portion disposed between said upright members at the central portion thereof, a seating portion extending forwardly from said leg receiving portion and extending substantially horizontally between said lower arcuate sections of said seat support members, back support means extending upwardly from the forward end of said seating portion, and arm support portions formed by said upper arcuate sections of the seat support members.

3,885,807

WHEELED VEHICLE WITH SNAP-IN WHEEL SUPPORTS

James W. Bradbury, Butler, and William Todeff, Cuyahoga, both of Ohio, assignors to The Huffman Manufacturing Company, Miamisburg, Ohio

Filed Jan. 17, 1974, Ser. No. 434,010
Int. Cl. B60b *37/00*
U.S. Cl. 280—80 R **9 Claims**



1. A wheeled vehicle comprising:

a. a chassis,

b. means defining slots in said chassis on opposite sides thereof,

c. a pair of wheel supports,

d. each of said wheel supports including a tongue portion and a body portion extending from said tongue portion and having inner and outer faces,

e. said tongue portions of said wheel supports being received in said slots formed in said chassis on opposite sides thereof,

f. said body portions of said wheel supports having said inner faces thereof overlying and engaging underlying portions of said chassis,

g. an axle extending across said chassis and through openings formed through said body portions of said wheel supports,

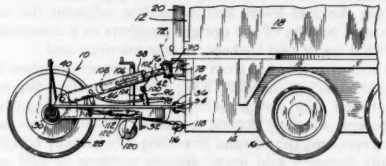
h. a pair of wheels positioned outwardly of said outer faces of said wheel supports and receiving opposite ends of said axle at opposite sides of said chassis, and

i. means fixing said wheels to said axle outwardly of said wheel supports and preventing outward pivoting movement of said wheel supports about said tongue portions thereof away from engagement of said body portions with said chassis and disengagement of said tongue portions from said slots.

3,885,808
DETACHABLE AUXILIARY LOAD DISTRIBUTING ASSEMBLY

Philip A. Derrwaldt, Brookfield, Wis., assignor to D. G. Beyer, Inc., Milwaukee, Wis.

Filed Jan. 5, 1973, Ser. No. 321,336
Int. Cl. B60g *17/00*
U.S. Cl. 280—81 R **12 Claims**



1. A detachable auxiliary load distribution assembly in combination with a vehicle-mounted mobile crane which includes a frame, said load distribution assembly comprising a dolly frame;

ground engaging wheel means on and supporting said dolly frame;

means for detachably connecting said dolly frame to the rear of said mobile crane frame;

a swivel assembly adapted to be positioned in engagement with said mobile crane frame and including

first means defining a generally horizontal axis for vertical movement of said dolly frame relative to said vehicle-mounted crane; and

second means defining a generally vertical axis for horizontal movement of said dolly frame relative to said vehicle-mounted crane;

means interengaging between said swivel assembly and said mobile crane frame providing butt engagement of said swivel assembly with said mobile crane frame to resist movement of said swivel assembly relative to said vehicle-mounted crane, said interengaging means including a horizontally and rearwardly extending wall member affixed to said mobile crane frame and having an underside against which said swivel assembly bears; and

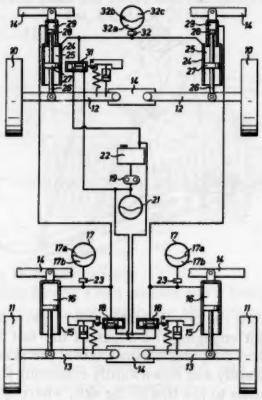
actuating means having a first end connected to said swivel assembly and a second end connected to said dolly frame, said actuating means being operable, when actuated and when said swivel assembly is engaging said interengaging means, to react through said butt engagement of said swivel assembly with said mobile crane frame and apply a downward force on said dolly frame thereby transferring a portion of the load from said vehicle-mounted mobile crane to said wheel means and so that said vertical and horizontal movement of said dolly frame is accommodated in said swivel assembly independent of said butt engagement.

3,885,809
VEHICLE SUSPENSION

Robert Hazell Pitcher, Leamington Spa, England, assignor to Automotive Products Co., Ltd., Leamington Spa, England

Filed Feb. 20, 1973, Ser. No. 333,647
Claims priority, application United Kingdom, Mar. 8, 1972, 10802/72
Int. Cl. B60g *11/30*
U.S. Cl. 280—112 A **3 Claims**

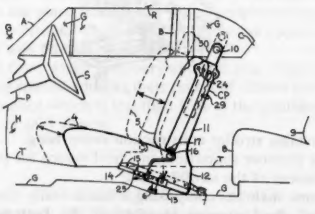
1. A vehicle suspension system including a wheel mounted structure with a first and a second pair of wheels, first liquid filled struts with a chamber therein connecting one of said first pair of wheels with a source of liquid pressure and a drain source to oppose relative up and down movement of the wheel mounted structure and the wheel to which said strut is connected, valves connecting one of said first pair of wheels to said source of liquid pressure and drain source to produce roll resistance for said first pair of wheels, second liquid filled struts each having a first and second chamber connecting one wheel of said second pair of wheels to said wheel mounted structure, another valve in communication with the second chamber of said second struts selectively operatively connected to said second chamber and a source of pressure and drain source to connect either second chamber therewith, said first chambers being in open communication with the chamber of one of the struts of said first pair of wheels, whereby the pressure in said first chamber of each strut of the second pair of wheels varies with the pressure in the first chamber of one of the struts of the first pair of wheels, the arrangement being such that the changes of pressure in said second chambers produce roll resistance at the second pair of wheels in the same sense as the roll resistance produced at the first pair of wheels.



3,885,810
SEAT SUPPORTING STRUCTURE FOR FAST MOVING VEHICLES

John J. Chika, 1350 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013

Filed Jan. 10, 1972, Ser. No. 216,344
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 B **46 Claims**



1. An auxiliary multi-function seat-supporting structure for seats of an enclosed transportation vehicle, positioned back of the seats and operatively attached to them, and secured to the immediately adjacent components of the floor structure of said vehicle and to the lower sides of the vehicle body immediately adjacent said seats and configured to provide:

means of additional support and transverse rigidity for said seats;

means to stabilize said seats in any preselected position during any severe deceleration of said vehicle;

means to prevent said seat from collapsing, upending and dislocating during a collision of said vehicle;

means for easy, convenient connecting and disconnecting of any individual-restraining devices used by said seat occupants back and inboard of their shoulders.

3,885,811

SELECTIVELY ENGAGEABLE THREE POINT VEHICLE SAFETY BELT

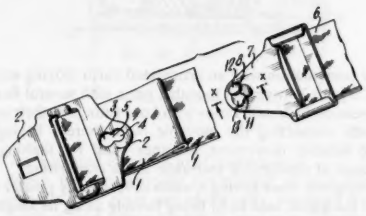
Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1973, Ser. No. 412,949

Claims priority, application Japan, Nov. 6, 19?2, 47-127220; Nov. 6, 1972, 47-127221

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 SB **12 Claims**



1. A safety belt system comprising a lap belt, a shoulder belt, a first coupling section attached to one of said belts and having formed therein a first opening and a second opening spaced from and of lesser width than said first opening and a restricted passageway connecting said first and second openings and of lesser width than said second opening, and a second coupling section including a coupling pin having an enlarged outer head portion of greater width than said second opening and of no greater width than said first opening, an intermediate portion of no greater width than said second opening and of greater width than said passageway and an inner portion of no greater width than that of said passageway, said pin being axially movable in said second opening when said pin is in engagement therewith between a lock position with said intermediate portion engaging said second opening and in longitudinal alignment with said passageway and an unlock position with said intermediate portion out of engagement with said second opening and said inner portion in longitudinal alignment with said passageway.

3,885,812

LOCKING DEVICE IN PARTICULAR FOR A SAFETY BELT

Hubert De Lavenne, Meudon, France, assignor to Automobiles Peugeot Regie Nationale des Usines Renault, Paris, France

Filed Jan. 7, 1974, Ser. No. 431,310

Claims priority, application France, Jan. 26, 1973, 73.02759

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 SB **9 Claims**

1. A locking device in particular for a safety belt secured at one end to a winder, the device comprising a fixed plate and a movable member defining a gap for the belt, links pivoted to the plate and to the movable member interconnecting the plate and movable member, the links being movable between a first position in which the movable member is in a position relative to the plate to allow the belt to move freely and a second position in which the gap between the movable member and plate is less than the thickness of the belt, resiliently yieldable means co-operative with the links and biasing the links toward said second position thereof, movement of the links from said first position toward said second position being in such direction that when the belt is pulled in a direction to cause the unwinding of the belt there is an increase in the clamping of the movable member against the belt and fixed plate, and actuating means for shifting the movable member away from the fixed plate and thereby releasing the belt, said

actuating means comprising an electromagnet having a moving armature, an electric circuit controlling the electromagnet, means connecting the armature to the links, the armature being adapted to act on the links in opposition to the action of the resiliently yieldable means.

3,885,813

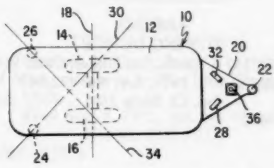
METHOD AND APPARATUS FOR LEVELING A TRAILER

Calvin V. Kern, Maumee, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Mar. 25, 1974, Ser. No. 454,640

Int. Cl. B60s *9/04*

U.S. Cl. 280—150.5 **9 Claims**



1. A method for leveling a trailer or similar vehicle having a longitudinally extending floor supported by first and second transversely spaced apart ground engaging means which establish a transverse axis for vertical pivotal movement of said trailer comprising the steps of: vertically pivoting the trailer about the axis until a line parallel to the trailer floor and passing through substantially the center of the ground engaging means on the uphill side of the trailer at an angle greater than 0° and less than 90° to the axis is level, partially supporting the trailer at a point along said line toward the downhill side of the trailer from the uphill side ground engaging means and vertically pivoting the trailer about said line until a line parallel to the trailer floor and non-parallel to said first-mentioned line is level.

6. In a trailer having a longitudinally extending generally rectangular floor supported by a pair of transversely spaced apart ground engaging means which establish a transverse axis for vertical pivotal movement of said trailer, the improvement comprising jack means mounted on the trailer for raising and lowering the front end of the trailer, a first adjustable support mounted on the trailer and located adjacent one rear corner of the trailer, a second adjustable support mounted on the trailer and located adjacent the other rear corner of the trailer, a first level mounted on the trailer and disposed to indicate the attitude of a line parallel to the floor of the trailer and passing through substantially the center of one of the ground engaging means and the location of the support adjacent the rear corner diagonally opposite from the one ground engaging means and a second level mounted on the trailer and

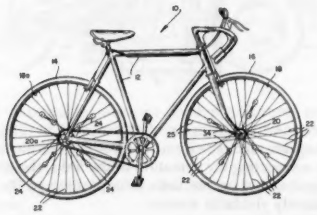
disposed to indicate the attitude of a line parallel to the floor of the trailer and passing through substantially the center of the other ground engaging means and the location of the support adjacent the rear corner diagonally opposite from the other ground engaging means.

3,885,814

CENTRIFUGAL BICYCLE WHEEL

Robert Rizzo, 305 E. 28th St., Brooklyn, N.Y. 11226

Filed July 8, 1974, Ser. No. 486,637
Int. Cl. B62m *1/10*
U.S. Cl. 280—217 **3 Claims**



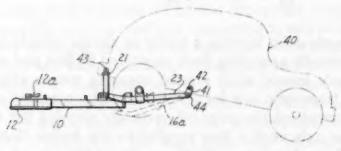
1. A wheel having an outer rim and central axle, a plurality of spokes extending between said axle and rim, a slidable weight spring biased and mounted on at least one of said spokes, a stationary yoke mounted on said spokes on the axle side of said weight, a spring extending between said weight and said yoke, said yoke having means for adjusting the radial position thereof on said spoke.

3,885,815

TOWING DEVICE

August A. Kniff, 137 S. Eucla, San Dimas, Calif. 91773

Filed Jan. 9, 1974, Ser. No. 432,067
Int. Cl. B60p *3/06*
U.S. Cl. 280—402 **9 Claims**



1. Towing means for towing a four-wheeled vehicle having a chassis from which its rear wheels mounted on an axle are suspended, comprising:

an attachment member having a cross bar provided with a coupling means and an upstanding means adapted to fasten to an under part of the rear end of the chassis of the towed vehicle, and having leg means extending from the cross bar forwardly beneath the rear axle to a forward position in front of the axle, said leg means having a tongue receiving means;

means at said forward position pivoting the leg means to the chassis;

slider means on the leg means adapted to be slid back and forth between a location beneath the axle and a location away from the axle;

a tow bar having a tongue at its forward end and an attaching means at an intermediate position of the tow bar for attaching to said coupling means;

said tow bar having a rear end extending rearwardly from said attaching means;

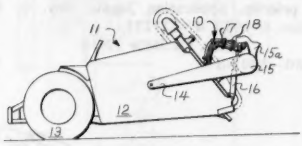
whereby when the tongue is attached to the tongue receiving means and the attaching means is fastened to the coupling means the rear end of the vehicle can be lifted by lifting the rear end of the tow bar.

3,885,816

TETHER BAND FOR FLEXIBLE HYDRAULIC HOSES

Lawrence J. Miller, and Roger M. Smith, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 223,466, Feb. 4, 1972, abandoned.
This application July 16, 1973, Ser. No. 379,587
Int. Cl. B60d *1/08*
U.S. Cl. 280—421 **1 Claim**



1. In combination with an articulated earth moving scraper having a joint between its movable parts with several flexible high pressure hydraulic hoses with hose fittings at their opposite ends connecting the movable parts thereof having restricted relative movement, a tether band for limiting the movement of the flexible hydraulic hoses comprising:

an elongated band having a width substantially greater than its thickness, said band being flexible along its longitudinal axis normal to its width;

anchor means on the opposite ends of said band for attaching said band to hose fittings on the opposite end of one of said hoses; and

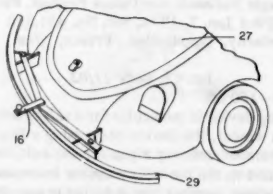
a plurality of bracket means disposed in spaced relationship along the length of said band with at least one of said bracket means located adjacent to each end of said band and the remaining bracket means disposed intermediately thereof, each of said bracket means mechanically secured to said band and forming a cage means about said several flexible hydraulic hoses gripping them sufficiently to prevent any substantial movement of said hoses parallel to the width of said band without interfering with their axial and radial growth movements, each of said bracket means including attaching means preventing its rotation about the longitudinal axis of said band.

3,885,817

TRAILER HITCH

Fredrick W. Christian, 8725 Baxter Way, Orangevale, Calif. 95662

Filed Feb. 6, 1974, Ser. No. 440,170
Int. Cl. B60d *1/00*
U.S. Cl. 280—491 E **3 Claims**



1. A tow hitch comprising a pair of horizontally disposed members defining an obtuse angle of less than 180° therebetween, a draft bar extending from the medial connected portions of said members, each of said members having a generally horizontally disposed portion, and a generally vertically disposed web portion extending downwardly therefrom, bolt

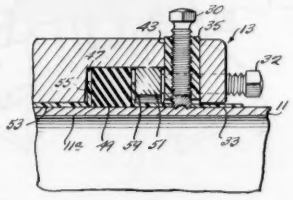
means extending through the respective end portions of the horizontal portions of said members, and plate means adjustably positioned on said bolt means for securing said apparatus to a draft vehicle.

3,885,818

INSULATED COUPLING JOINT

Paul R. Ammann, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Apr. 2, 1974, Ser. No. 457,355
Int. Cl.[2] F16L *58/00*
U.S. Cl. 285—31 **5 Claims**



1. An insulated coupling joint comprising:

a fitting for mechanically connecting at least two pipes wherein said pipes are electrically insulated from one another, said fitting having at least one cylindrical pipe receiving passageway therethrough, an annular groove extending about the internal periphery of a first end thereof, and at least one insert receiving hole proximate said first end of said passageway, said hole extending radially from said passageway to the outside periphery of said fitting,

a deformable gasket formed of an electrical insulating material positioned in said annular groove,

a lock insert positioned in each of said insert receiving holes, said lock insert being an electrical insulator and having a threaded hole therethrough,

means for inhibiting the rotation of said lock insert with respect to said fitting,

means for preventing the radial movement of said lock insert with respect to said hole,

a set screw threaded through said lock insert, and

an insulator sleeve positioned about the portion of a pipe which extends into said first end of said passageway of said fitting, said set screw being threaded until the end thereof cuts through said insulator and into said pipe to a predetermined level,

means for deforming said gasket in a radial direction to thereby cause said gasket to grip and retain said pipe, and means for securing the other end of said fitting to a pipe which extends into the passageway at said other end of said fitting.

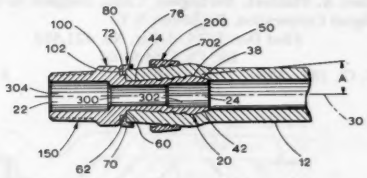
3,885,819

COMPRESSED AIR HOSE CONNECTION

Herbert Egerer, 4002 S. 89th St., Omaha, Nebr. 68131, and Donald W. Carlson, 8900 F. St., Omaha, Nebr. 68107

Filed Nov. 21, 1972, Ser. No. 308,403
Int. Cl. F16l *35/00*
U.S. Cl. 285—93 **5 Claims**

1. A hose fitting assembly comprising an annular nipple for receiving a hose therearound and having a passage therethrough extending from a terminal end thereof, said nipple having an axis extending through at least a portion of said passage beginning at said terminal end, said nipple having an enlarged annular exterior surface portion disposed between its ends and surrounding said axis, said enlarged surface portion being generally spaced a greater distance from said axis than other portions of the exterior of said nipple adjacent to said enlarged portion, said enlarged portion having an outer surface facing away from said axis which has an annular backside surface section facing partially away from said terminal end and inclined with respect to said axis, said backside surface section generally gradually tapering from a larger diameter at that end of said backside surface which is nearest said terminal end to a lesser diameter at its opposite end, and in which an abutment means is attached to said nipple and protrudes from said nipple away from said axis, said abutment means being disposed on the opposite side of said enlarged portion from said terminal end for receiving an end of said hose there-



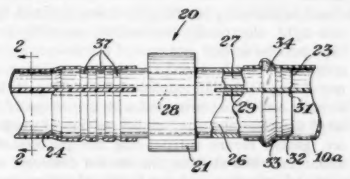
against to limit movement of said hose onto said nipple, said abutment means being annular and surrounding and being attached to the remainder of said nipple all around said axis, said abutment means having an annular ledge protruding from that side thereof which faces said terminal end of said nipple, said ledge being spaced farther from said axis than those certain adjacent portions of the remainder of the outer surface of said nipple which latter portions are disposed toward said terminal end for the reception of an end of said hose between said ledge and said certain adjacent surface portions of said nipple, and in which said ledge is transparent enough so that an operator can see the end of said hose therethrough.

3,885,820

TUBING CONNECTOR

Walter A. Trumbull, Midland; James A. Schlosser, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 5, 1973, Ser. No. 412,946
Int. Cl. F16l *39/00*
U.S. Cl. 285—137 R **3 Claims**



1. A connector for a multiple passage tube, the connector comprising

a body portion having at least

a first tube receiving end of generally cylindrical configuration, the first tube receiving end having defined therein

a first passageway and

a second passageway, each of the passageways being in full communication with space external to the first end, the body defining at least

one wall separating the first and second passages, the wall between said first and second passages at a location adjacent the first end defining

a first end slot extending inwardly into the wall from said first tube receiving end, the first end slot being generally parallel the first and second passageway and communicating with space external to the first tube receiving end both in axial and diametrical direction,

a second end of generally cylindrical configuration, having a second end first passageway and a second end second

passageway, said second end passageways being in full communication with first and second passageways of the first end,

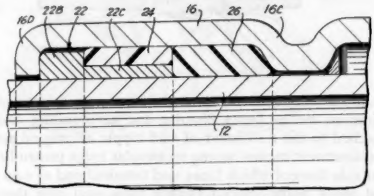
the second end defining a second end slot extending toward the first end slot, the second end slot disposed between the first end first and second passageways, the first and second slots being of generally like configuration.

3,885,821

EXPANSION FITTING

Robert A. Philibert, Burlington, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Dec. 5, 1973, Ser. No. 421,882
Int. Cl. F16l *55/00*
U.S. Cl. 285—175 **5 Claims**



1. An expansion fitting adapted for coupling or connecting electrical metallic tubing, comprising:

a pair of lengths of electrical metallic tubing, each having substantially the same predetermined diameter;

a sleeve of electrical metallic tubing having, substantially throughout its length, a diameter slightly larger than the diameter of the pair of lengths of tubing, the sleeve fitting over adjacent end portions of each of said lengths of tubing in overlapping relationship;

the adjacent end portion of one length of tubing being in telescopic sliding relationship with one end of said sleeve, and the adjacent end portion of the other length being in rigid coupling relationship with the other end of said sleeve;

the said telescoping relationship being defined by a moisture-tight, electrically continuous, assembly including a bent portion at said one end of the sleeve;

a split metal ring engaged by said bent portion, said split metal ring having an axially extending gap at its circumference and being provided with a portion of relatively large diameter and a remaining portion of smaller diameter, gasket means surrounding the portion of smaller diameter, while abutting the smaller diameter end of the ring and engaging said one length of tubing; and

further including a crimped portion at the one end of said sleeve, said crimped portion engaging said gasket means, said bent portion of said sleeve being bent inwardly and firmly engaging the end of the ring having the larger diameter.

3,885,822

AUTOMATIC LOAD AND VACUUM SENSITIVE EXHAUST HOOD SPRAY SYSTEM

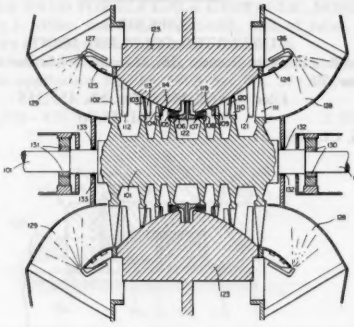
Albert Cohen, Wallingford; Frank O. Burckhalter, Newtown Square, and Michael C. Luongo, Brookhaven, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 21, 1974, Ser. No. 481,934
Int. Cl. F01d *5/00*
U.S. Cl. 290—1 R **41 Claims**

1. In a turbine generator system having an exhaust hood on at least one turbine and cooling sprays for said hood, hood spray control apparatus comprising:

a. means for measuring the present load of said generator;

b. means for measuring the present exhaust vacuum of steam from said turbine; and



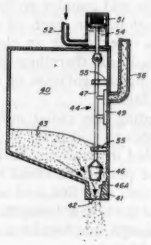
c. means responsive to the measured present load and to the present measured exhaust vacuum for selectively activating said cooling sprays.

3,885,823

WINTER EMERGENCY BRAKE SYSTEM

Poy Lee, 52 Tennyson St., Somerville, Mass. 02145

Filed Aug. 3, 1973, Ser. No. 385,419
Int. Cl. B60b *39/04;* **B61h** *11/00*
U.S. Cl. 291—15 **10 Claims**



1. Apparatus for use with a motor vehicle having wheels, a brake pedal, a master brake cylinder operated in response to application of the brake pedal and fluid lines coupling from the master brake cylinder to separate wheel brake means, said apparatus for depositing sand or the like on a roadway adjacent at least one wheel of the motor vehicle, and comprising:

a tank positioned adjacent the wheel and having an outlet through which sand may be deposited and an inlet through which sand may selectively flow to the tank,

a first valve means including a fluid operated valve and a closure member responsive to said fluid operated valve being in a first position for closing the outlet and in a second position for opening the outlet,

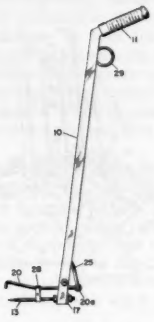
means including fluid conduit means coupling from the vehicle fluid line to the fluid operated valve and responsive to actuation of the brake pedal of the vehicle for causing said valve to change to its second position for opening the outlet,

and a second valve means disposed in the fluid conduit means and having alternate positions for either permitting or preventing fluid flow to the first valve means.

3,885,824
PICKUP DEVICE

Henry J. Hulst, 18730 Elaine Ave., Artesia, Calif. 90701

Filed Feb. 1, 1974, Ser. No. 438,789
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 R 2 Claims

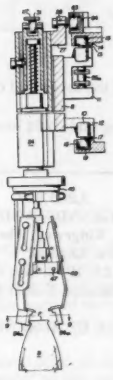


1. A pickup device comprising:
an elongated channel-shaped body having a face member and two opposing side members;
a handle attached to the upper end of said body forming an angle therewith, wherein the channel opening of said body is on the same side of said handle;
a pad bonded to both of said side members at the lower end thereof, and parallel to said face member;
said pad and said face member each having a hole which are aligned with each other;
a fixed finger having a point at one end and being threaded at the other end disposed through said aligned holes;
a pair of nuts threaded on said finger and disposed one against said face member and one against said pad;
a loop fixed to said finger;
each of said side members having a bore which are aligned to each other and spaced from said pad;
a threaded bolt extending through said aligned bores and having a nut on the other end, fixing the bolt to said body;
a pivotable finger having a nut bonded thereto, which bonded nut is disposed threaded onto said bolt between said side members;
said face member having a slot extending lengthwise therein with the said pivotable finger disposed to extend through said slot;
said pivotable finger being disposed to pivot within the same plane of said fixed finger and protruding through said loop;
an elongated rod extending along said body within the channel and pin-connected by its lower end to said pivotable finger so that as said rod is moved axially, said pivotable finger pivots about said bolt;
a sleeve mounted on the upper end within and aligned with said body to receive the upper end of said rod to allow the rod to move axially with respect to said body;
a compression spring disposed within said sleeve to urge the rod out of its sleeve; and
trigger means disposed on said rod to allow the operator to lift up on the rod to compress said spring and to pivot said pivotable finger.

3,885,825
ARTICLE HANDLING CHUCK

Stephen W. Amberg, St. James; Thomas E. Doherty, Setauket, both of N.Y., and Clarence A. Heyne, Sun City, Ariz., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 209,751, Dec. 20, 1971. This application July 11, 1973, Ser. No. 378,336
Int. Cl. B65g *17/20*
U.S. Cl. 294—115 12 Claims



5. A chuck for supporting an article comprising
a housing,
an elongate rod means mounted in said housing for axial reciprocal movement,
a plurality of movable chuck elements for engaging the article each including an elongate holder having a chuck jaw attached adjacent one end thereof,
hub means connected with said rod for movement therewith,
rock arms pivotally attached to said housing intermediate their ends and mounting them in radially spaced apart relationship on said hub means,
link means pivotally connected on said hub means and connected near one end of each of said rock arms,
spaced studs on said rock arms,
cooperating elongated slots on said holders, the holders being supported on the rock arms for independent longitudinal movement, and
means operable for moving said rod means in opposite directions alternately for closing said chuck jaws collectively about an article and for opening the chuck jaws.

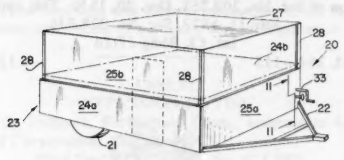
3,885,826
CAMPER VEHICLE WITH MOVABLE TOP

Omer G. Kropf, Millersburg, Ind., assignor to Rockwood, Inc., Topeka, Ind.

Filed Dec. 22, 1972, Ser. No. 317,564
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 R 21 Claims

1. A vehicle having a body and a top vertically movable between positions elevated above and adjacent to said body, a pair of transversely flexible push rods each having a generally horizontal portion, an intermediate curved portion and a generally vertical portion,
means for connecting said vertical portions to said top,
means for guiding each push rod during movement thereof in a predetermined path,
each said push rod having a lower end and said horizontal portions extending in opposite directions therefrom,

and reversible means for moving said lower ends simultaneously, equally and oppositely comprising endless flexible chain means having a first run and a second run,



means connecting the lower end of each said push rod to a said run,

and means for driving said chain means selectively in either direction.

3,885,827

GRANDSTANDS

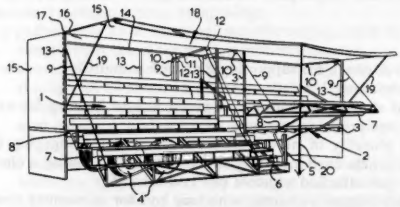
John Edward Sanders, Ridgeway, The Moorings, Lower Heswall, Wirral, Cheshire, England

Filed Dec. 21, 1972, Ser. No. 317,230

Claims priority, application United Kingdom, Sept. 7, 1972, 41471/72

Int. Cl. B60n *1/02*

U.S. Cl. 296—64 **39 Claims**



1. A mobile grandstand comprising a substantially horizontal base which can be moved to any desired location, means supporting said base above the ground, a plurality of seats mounted on the base in tiered rows ready for use, an aisle of steps dividing the seats on the base and allowing access thereto, a seat extension formed by interconnected rows of seats hinged to an edge of the base and arranged to be hinged downwardly to provide seats from ground level to the base and to be hinged upwardly ready for transportation, and an aisle extension of steps hinged to said edge of the base for allowing access to the seat extension.

3,885,828

FOLDING CHAIR

Clayton Leon Shepard, 824 S. Main St., Bluffton, Ind. 46717

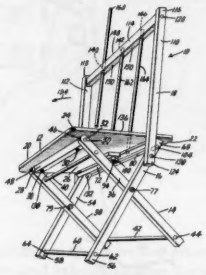
Filed Feb. 11, 1974, Ser. No. 441,375

Int. Cl. A47c *4/14*

U.S. Cl. 297—52 **1 Claim**

1. A folding chair comprising a planar seating panel of predetermined width, open and generally rectangular outer and inner leg frames, said inner frame being dimensioned to be received between the sides of said outer frame, said outer frame having a width generally equal to the width of said panel, said inner and outer frames being pivotally connected at points generally midway between the ends thereof, one of said frames having one end thereof pivotally coupled to said panel adjacent the forward end thereof, means secured to the upper end of the other of said frames and to the rear end of said panel for selectively coupling said upper end of said other frame to said rear end of said panel, a seat back including a generally rectangular and open frame, means pivotally coupling said back frame adjacent the lower end thereof to the upper end of said other leg frame for pivotal movement with respect thereto, means for supporting said seat back in a position upstanding with respect to said panel, said back frame being dimensioned to receive said other frame and said panel therebetween, whereby, said inner, outer, and back frames can be folded into co-planar relationship and parallel to said panel,

said back frame including a pair of elongated members pivotally coupled adjacent their lower ends to said upper



end of said other leg frame and connected adjacent their upper ends by a transverse member, said transverse member having a plurality of spaced openings therein, said seating panel having a plurality of spaced openings therein adjacent said rear end thereof and respectively aligned with said transverse member openings, said upper ends of said dowels being respectively, removably received in said transverse member openings and said lower ends thereof being respectively, removably received in said panel openings.

3,885,829

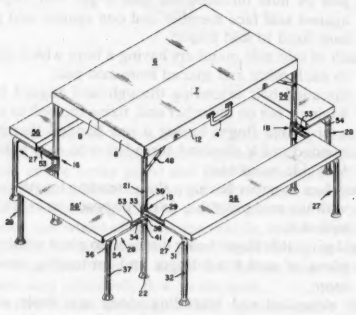
FOLDABLE TABLE AND BENCH ASSEMBLY

Virgil J. Haeger, 3081 Melchester Dr., Cheney, Wash. 95132

Filed May 4, 1973, Ser. No. 357,207

Int. Cl. A47b *3/14*

U.S. Cl. 297—159 **9 Claims**



1. A foldable table assembly comprising:

a. a table top formed from a pair of flat plates each having a peripheral flange constituting integral opposite end and side flanges;

b. means pivotally connecting associated edges of said plates to enable selective orientation of said plates from a position of planar alignment wherein they form a flat table top to a position of spaced parallelism wherein the edges of said flanges on the juxtaposed parallel plates are in alignment whereby said plates and peripheral flanges

cooperate toform a closed container when said table top is folded;

c. a leg assembly pivotally mounted in each corner of said unfolded table top and selectively extensible to a position perpendicular to said table top and retractable to a position parallel to said table top wherein said leg assemblies lie nested within said peripheral flanges surrounding said flat plates, said leg assembly including an elongated tubular leg member extending from said table top to a supporting surface such as the ground or floor and an auxiliary leg structure comprising a horizontal bench mounting section pivotally mounted to the elongated tubular leg member intermediate its ends for pivotal movement through 360° about said tubular leg member and a vertical leg section integral with said horizontal bench mounting section, said vertical leg section of the auxiliary leg structure lying parallel to said elongated tubular leg member in both the folded and unfolded positions of said leg assembly; and

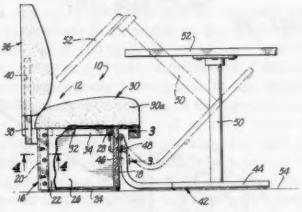
d. detachable bench means bridging the space between and selectively engageable at each opposite end with the horizontal bench mounting sections of auxiliary leg structures at opposite corners of said table top whereby each detachable bench cooperates with said table top and a pair of said leg assemblies to stabilize the table and to provide seats at said table which correspond in length to the side of the table top with which they are associated.

3,885,830

BENCH SEAT

Ferris E. Jones, 943 Millbury, La Puente, Calif. 91746

Filed June 18, 1973, Ser. No. 371,168
Int. Cl. A47c *7/62*
U.S. Cl. 297—193 **3 Claims**



1. A bench seat comprising a hollow rectangular frame having front, rear and end walls forming a storage receptacle with a top opening:

a seat member removably supported atop said frame with said seat member resting on the upper edges of at least certain of said frame walls and including a lower depending shoulder formation projecting into said opening for locating said seat member relative to said frame,

a backrest member along the rear edge of and rising above said seat member, and

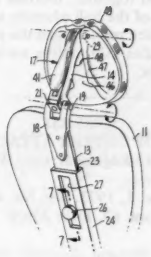
means fixed to said frame supporting said backrest member on said frame for vertical movement totally independently of and without moving said seat member between a lower position of use wherein the lower edge of said backrest member contacts the rear edge of said seat member to hold the seat member in seating contact with the upper edges of said certain frame walls and thereby retain the seat member in position on said frame and an elevated retracted position wherein the seat member continues to rest in the upper edges of said certain frame walls and said backrest member is spaced from said seat member to permit removal of said seat member.

3,885,831

CLOSE-COUPLED ARTICULATING HEADREST

Keith O. Rasmussen, 990 Broadway, San Francisco, Calif. 94133

Filed Jan. 24, 1974, Ser. No. 436,140
Int. Cl. A47c *3/00, 7/48*
U.S. Cl. 297—410 **12 Claims**



1. A close-coupled articulating headrest system for treatment chairs and the like, comprising

a tongue member adapted for longitudinally adjustable engagement with the back of the chair,

a link member pivotally attached at one end thereof to said tongue member,

a dished cushion support plate pivotally attached adjacent the upper edge thereof to the end of said link member opposite said tongue member, and

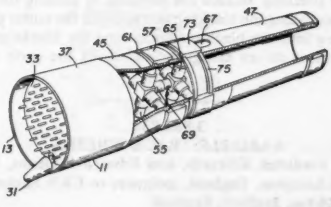
overcenter toggle clamp means adapted for simultaneous releasable locking of pivotal motion of said link member both with respect to said tongue member and with respect to said cushion support plate.

3,885,832

APPARATUS AND METHOD FOR LARGE TUNNEL EXCAVATION IN HARD ROCK

John H. Altseimer, and Robert J. Hanold, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 25, 1974, Ser. No. 436,401
Int. Cl. E21d *9/00*
U.S. Cl. 299—14 **3 Claims**



1. An earth drilling machine for excavating tunnels comprising an elongated hollow hull having a frontal portion with cross section equal to the cross section of the final tunnel prior to installation of final tunnel wall lining and a rearward portion reduced in cross-section relative to the frontal portion, a rock melting kerf penetrator affixed to and projecting longitudinally forward of the front end of the hull and having a peripheral shape similar in configuration with the front portion of the hull, a hull closure face plate affixed to the interior of the hull at the front end thereof, a plurality of rod-shaped thermal stress fracturing penetrators supported in said hull closure face plate with their direction of elongation parallel to

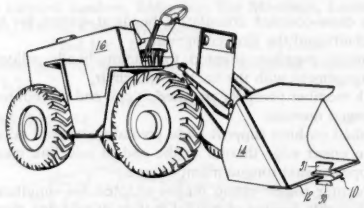
the direction of elongation of the hull, and projecting forward of the front surface of the hull closure plate, rock debris removal means supported in a peripheral portion of the hull closure plate, a nuclear reactor supported within the hull of the machine, heat pipe heat conduction means coupled to the reactor core at one end and to the kerf melter and thermal stress fracturing penetrators at the other end; the rear end of the kerf melting penetrator skirt and the front end of the hull being smoothly joined together, thermal cooling means coupled to the front end of the hull whereby said front end of the hull supports the molten rock against the excavation walls and simultaneously solidifies said molten rock into a tunnel wall initial supporting liner.

3,885,833

BLACKTOP CUTTER ATTACHMENT

Pierre C. Lemieux, 143 Edgemont Ave., West Hartford, Conn. 06110

Filed Nov. 1, 1973, Ser. No. 411,657
Int. Cl. E01c *23/09*
U.S. Cl. 299—36 **7 Claims**



1. A blacktop cutter attachment adapted to be mounted on the lower edge of a blade or bucket of a conventional earth moving vehicle comprising a combination surface guide and support for guiding the cutter attachment along a blacktop surface and having a rear transversely extending slot for receiving the lower edge of a blade or bucket of a conventional earth moving vehicle for supporting the attachment thereon, and a depending cutter plate fin fixed to the combination surface guide and support having a forward cutting edge for cutting the blacktop surface as the cutter attachment is driven therealong by the earth moving vehicle, the combination surface guide and support having surface guide portions on both lateral sides of the depending cutter plate fin engageable with the blacktop surface for assisting in guiding the cutter attachment along the blacktop surface with the cutter plate fin depending into the blacktop for cutting the blacktop as the attachment is driven along the surface by the earth moving vehicle.

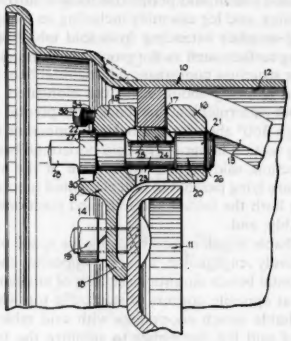
3,885,834

VARIABLE TRACK WHEELS

Michael Frederick Edwards, and Edward Williams, both of Wolverhampton, England, assignors to GKN Sankey Limited, Bilston, Stafford, England

Filed Dec. 6, 1973, Ser. No. 422,598
Claims priority, application United Kingdom, Dec. 7, 1972, 56532/72
Int. Cl. B60b *27/00*
U.S. Cl. 301—9 TV **3 Claims**

1. A wheel comprising a rim, a separate disc, a number of part helical rails secured on the radially inner surface of the rim, guides secured to the disc which engage the rails whereby as relative rotation takes place between the rim and disc their relative positions change in directions parallel to the rotary axis of the wheel, locking means on each of the guides operable frictionally to engage radially inwardly facing surfaces on the rails by applying forces directed outwardly of the centre of the wheel to said inwardly facing surfaces to lock the disc and rim in a desired relative position, at least one of the guides carrying a set pin in addition to the locking means, said set pin



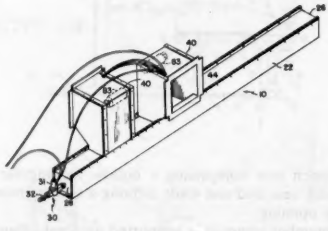
being arranged to engage the side face of the rail engaged by the locking means to supplement the locking effect of the latter.

3,885,835

WASTE DISPOSAL SYSTEM

John F. Breeden, Royston, Ga., assignor to Hopeman Brothers, Inc., New York City, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,804
Int. Cl. B65g *53/04*
U.S. Cl. 302—39 **12 Claims**



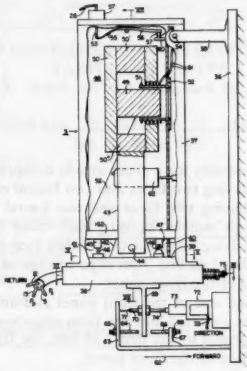
1. A waste disposal system for paper towels or the like comprising means providing an elongated waste disposal passageway, means defining a waste depository chamber having an inlet opening adapted to receive waste to be disposed of and an outlet opening communicating with said disposal passageway, door means extending across said inlet opening and mounted for movement from a normal position extending across said inlet opening and an open position permitting the depositing of waste through said inlet opening into said depository chamber, air means for directing the flow of air through said disposal passageway past said outlet opening to transport waste delivered into said disposal passageway from said depository chamber to a remote location for disposal thereof, and control means responsive to the movement of said door means toward said open position to actuate said air means to effect the blowing of air through said waste disposal passageway.

3,885,836

ACCELERATION CONTROLLED BRAKING SYSTEM

Thomas H. Putman, Pittsburgh, Pa., and William O. Osbon, Griffith, Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 28, 1974, Ser. No. 437,404
Int. Cl. B60t 8/14
U.S. Cl. 303—24 A 7 Claims



1. In apparatus for controlling the application of brakes on a vehicle, the combination comprising:

means for providing a reference signal having a magnitude indicative of the desired braking effort for said vehicle;

valve means, including first and second valves;

means for causing said first and second valves to move towards one valve condition and the opposite valve condition respectively in response to the magnitude of said reference signal changing in one sense, and to move towards said opposite valve condition and said one valve condition respectively in response to the magnitude of said reference signal changing in the opposite sense;

means for causing said first and second valves to move towards said opposite valve condition and said one valve condition respectively in response to a sensed deceleration when said vehicle is moving in one direction, and for causing said first and second valves to move towards said one valve condition and said opposite valve condition respectively in response to a sensed deceleration when said vehicle is moving in the opposite direction; and

means for applying the brakes on said vehicle in response to said first and second valves being in said one condition as said vehicle moves in said one and said opposite directions respectively.

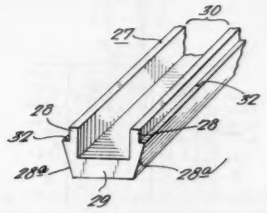
3,885,837

LINEAR BEARING HAVING REPLACEABLE INSERT

Harrison Clay Mellor, 194 Providence Rd., Newtown Square, Pa. 19144

Filed May 29, 1973, Ser. No. 364,312
Int. Cl. F16c 17/00
U.S. Cl. 308—3 R 6 Claims

1. A linear bearing comprising: a base element having an elongated slot, an insert mounted within said slot, said insert being fabricated from a low-friction material and said base element being fabricated from a rigid material different from said base element material, said insert having a bottom wall and a pair of spaced upright sidewalls defining therebetween an upwardly-open groove, said sidewalls being flexible in a direction transverse to said slot and having smooth outer surfaces tapering inwardly toward one another in a downward direction, interengaging means on said base element and said insert for releasably retaining said insert in said slot, said interengaging means including a pair of inwardly extending ledges on said base element and a complementary pair of notches extending along the upper margins of the tapered sidewall surfaces coextensive in length with the insert, said base element ledges extending into said slot and terminating in spaced relation for cooperating with said tapered sidewall



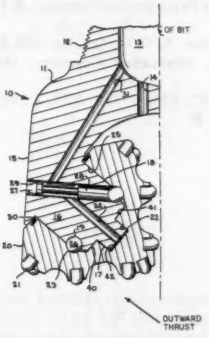
surfaces to flex said sidewalls inwardly when said insert is displaced downwardly into said slot, said ledges overlying the shoulders to secure the insert to the base element when the insert is mounted in the slot with the ledges of the base element received in the notches of the insert, whereby the insert is capable of expanding and contracting relative to the base element while being capable of being readily removed and replaced.

3,885,838

DRILL BIT BEARINGS

John S. Childers, and Clayton C. Mandrell, both of Houston, Tex., assignors to Reed Tool Company, Houston, Tex.

Filed June 14, 1973, Ser. No. 370,170
Int. Cl. F16c 21/00
U.S. Cl. 308—8.2 9 Claims



8. A drill bit bearing including:

a bearing shaft of carburizing steel extending downwardly and inwardly toward the rotational axis of a rotary head carrying said bearing shaft,

a roller cutter also of carburizing steel on said shaft,

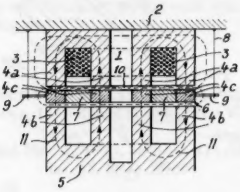
the shaft and cutter each having a friction bearing surface arranged to carry outboard thrust loads imposed on the cutter,

the surfaces of said shaft and said cutter being carburized except at least one of said friction bearing surfaces being uniformly uncarburized throughout at least a substantial portion thereof to alleviate frictional heat cracking thereof during drilling operation.

3,885,839
MAGNETIC BEARING

Helmut Habermann, Vernon, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Aug. 20, 1973, Ser. No. 390,009
Claims priority, application France, Aug. 23, 1972, 72.30092
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **7 Claims**

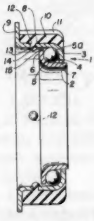


1. A magnetic bearing comprising stator means, a rotor, air gap means between said stator means and rotor, means for creating magnetic flux linking the rotor and stator means across said air gap means, at least one magnetic body, means mounting said body in said air gap means for movement relative to said stator means and the rotor in a radial direction at least approximately perpendicular to the flux path across the air gap means, and friction means positioned between the said body and said stator means for resisting displacement of said body along said radial direction.

3,885,840
CONNECTING LINK FOR THE RACES OF BALL BEARINGS

Gunter Neder, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Mar. 5, 1974, Ser. No. 448,264
Claims priority, application Germany, Mar. 20, 1973, 7310449
Int. Cl. F16c *27/06, 1/24, 33/78*
U.S. Cl. 308—184 R **9 Claims**

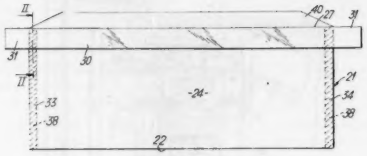


1. A ball bearing assembly for a steering column comprising an outer ring and an inner ring inserted therein, said rings defining annular bearing surfaces for a plurality of ball bearings located therebetween, one of said rings having a plurality of holes spaced about its circumference, an annular elastic member located on the surface of said one ring, said elastic member having lugs extending through said holes adjacent the end of the other race ring to thereby connect said race rings.

3,885,841
POCKETS FOR ARTICLES IN SHEET FORM

Arthur William Stevens, Westgate-on-Sea, England, assignor to Monodex Business Systems Limited, Kent, England

Filed Oct. 26, 1973, Ser. No. 409,815
Int. Cl. A47b *63/00*
U.S. Cl. 312—183 **10 Claims**

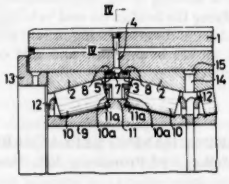


1. A pocket assembly for a sheet article comprising
a front panel having two faces and two lateral edges,
a back panel having two faces and two lateral edges, the front and back panels opposing each other with a first face of each lying adjacent each other face-to-face and united at a first fold line from edge-to-edge of the panels at a first end of the front panel,
a lip at a second end of the front panel and united to the front panel at a second fold line from edge-to-edge of the panel and parallel to the first fold line, the lip overlying the second face of the front panel,
the lip and the front and back panels being a unitary one-piece sheet of material,
a channel strip having a base and two opposed and parallel side walls,
the base of the channel being disposed over the second fold line with the two side walls overlying the one face of the front panel and the lip respectively,
end portions of the channel strip projecting laterally beyond respective lateral ends of the lip,
and securing means holding together the front and back panels adjacent their edges and holding the channel strip in the assembly.

3,885,842
BEARING LUBRICATING DEVICE

Takashi Furutsu, Osaka, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan

Filed Sept. 21, 1973, Ser. No. 399,542
Int. Cl. F16c *1/24*
U.S. Cl. 308—187 **5 Claims**



1. A double-row roller bearing lubricating device for a housing having a bore and a bearing assembly including a pair of outer races fitted to the bore of the housing, inner race means and a plurality of rollers disposed between the outer races and said inner race means said lubricating device comprising a dry oil mist inlet extending through the housing into the bore between the pair of outer races, a spacing member disposed between the outer races; an annular passageway extending around the spacing member in the bore of the housing communicating with the dry oil mist inlet for receiving dry oil mist therefrom; a plurality of mist nozzle means in

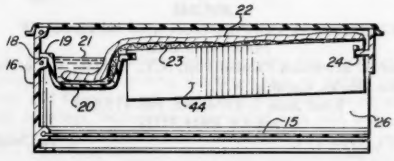
the spacing member opening inwardly and communicating with the annular passageway; packing means on both sides of the annular passageway for effecting oil-tight sealing between the outer periphery of the spacing member and the bore of the housing for confining dry oil mist in said passageway between the outer periphery of the spacing member and a corresponding inner face of the bore in the housing so that dry oil mist is discharged from the passageway through said mist nozzle means and expands to supply wet oil mist between the rollers of the bearing assembly.

3,885,843

ARTIST HUMIDIFIER FOR PALETTE DISPLAYED PAINTS AND VALUES

George K. E. Rubel, 4116 E. Stanford Dr., Phoenix, Ariz. 85018

Filed Mar. 29, 1974, Ser. No. 456,189
Int. Cl. B44d *7/00*
U.S. Cl. 312—31 **10 Claims**



1. A humidifier for palettes containing air drying paints and values during their use and storage comprising:

a shallow rectangular box comprising a front, back and a pair of end members forming a container for receiving one or more palettes laterally between its side members, a cover for engaging the edges of said front, back and end members of said container,

said container having an opening within said front member for slidably receiving said palettes and for supporting said palettes when partially and fully positioned within said container,

means for supporting a wick in an inclined position juxtapositioned to and across the paint and value receiving surface of a palette, and

at least one sump mounted on said container for receiving water and one end of said wick,

whereby said wick absorbs water in a capillary manner and generates a moist atmosphere above the surface of a paint supporting palette when fully within said container and when said palette is pulled partially out of said container.

3,885,844

BATHROOM CABINET, ESPECIALLY FOR HOSPITALS

Walter Schneider, Wildenbuhlstrasse 54, CH-8135-a.-A. Langnau, Switzerland

Filed Jan. 2, 1974, Ser. No. 429,552
Claims priority, application Switzerland, Feb. 1, 1973, 1414/73
Int. Cl. A47b *67/00*
U.S. Cl. 312—227 **11 Claims**

1. A bathroom cabinet comprising:

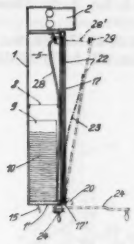
a housing with an open front side and a door for closing said front side, said door being swingable about a vertical axis;

a mirror on an outer face of said door mounted for tilting relative thereto about a horizontal lower edge thereof;

operating means for said mirror on said housing near the bottom thereof;

locking means in said housing mounted on said door near the top thereof for holding said door closed, said locking means being engageable by said mirror in an upright position of the latter for deactivation to permit opening of said door; and

biasing means in said housing acting upon said locking means for urging same into operative engagement with a



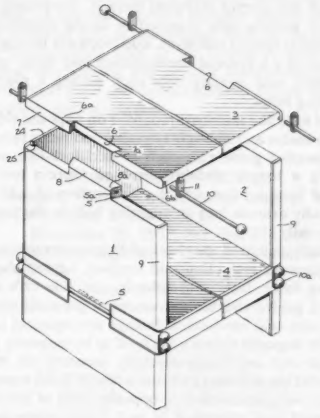
coacting housing parts upon a forward tilting of said mirror into an inclined position, thereby preventing said door from being opened.

3,885,845

KNOCK-DOWN FURNITURE SYSTEM

Hans Krieks, 3 Horizon Rd., Fort Lee, N.J. 07024

Filed June 27, 1974, Ser. No. 483,546
Int. Cl. A47b *43/00*
U.S. Cl. 312—265 **11 Claims**

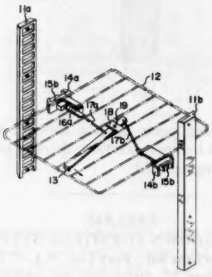


1. A knock-down furniture system comprising at least one set of two side panels and top and bottom panels which can be assembled in edge-to-edge relationship to form a basic unit having four walls formed by said panels, each two of said panels having edge sections which when said unit is assembled, are mutually adjacent and formed to provide a dovetail joint therebetween with a male joint portion in one of said sections and a female joint portion in the other of these sections, said panels having said female joint portions being formed with holes extending entirely through their said edge sections and open into said female joint portions, and said panels having said male joint portions having holes entering into their said male joint portion and which register with the first-named holes when said joint portions are interfitted, and pins proportioned for insertion through said holes in said sections having said female portions and projection into said holes in said male portions, for releasably interfastening said dovetail joints.

3,885,846
ADJUSTING APPARATUS FOR REFRIGERATORS SUPPORTING SHELF

Lieh Chuang, 12 Ln. 84, T'ung Jen St., Keelung, and Shin Chi Lin, 4th Fl., No. I-I, Ln. 1, Fu Shun St., Taipei, both of Taiwan/China

Filed Dec. 5, 1973, Ser. No. 421,860
Int. Cl. A47b *57/08*
U.S. Cl. 312—306 1 Claim



1. An adjusting apparatus for supporting shelves of a refrigerator from the interior sidewalls thereof, comprising:

a pair of guiding rails disposed in facing relationship on oppositely spaced sidewalls, said sidewalls having a cross section of a trapezoid configuration and being vertically disposed, said guiding rails each having a plurality of adapting holes;

a pair of fork-like members mounted on opposite side edges of the shelve and slidingly engaging and being retained on a respective guide rail, each of said fork-like members having a tongue slidably disposed therein and spring biased to a position where a tip portion of said tongue normally extends into an adapting hole in the associated guide rail;

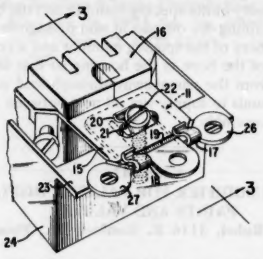
a manually actuated mechanical linkage arrangement for simultaneous retracting said tongues, against the spring biasing force, from said holes in said side rails so as to permit guided slidable movement of the shelf along said side rails, said mechanical linkage arrangement having a handle disposed beneath the shelf to be manually grasped at one end and being pivotally mounted on the shelf adjacent the opposite end, and a pair of force transmitting means being connected on opposite sides of the pivotally mounted and extending to and being connected to a respective tongue.

3,885,847
GROUNDING CLIP WITH WRAP-AROUND TABS

Ronald N. Thibeault, Buena Park, Calif., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed Mar. 27, 1974, Ser. No. 455,419
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R 5 Claims

1. An electrical clip grounding device for interconnecting an electrically conductive mounting strap of an electrical wiring device to an electrically conductive mounting box threadedly engageable by a mounting screw, said clip device comprising a flat, U-shaped, electrically conductive member having spaced legs bridged at the base thereof, wrap-around tabs at the free ends of said legs and on the bridge between the base of said legs of said U-shaped member, said wrap around tabs extending out of the plane of said flat U-shaped member, one edge of each tab being integral with said member while the opposite free edge extends towards said bridge, said wrap-

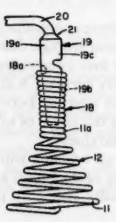


aroundtabs being resiliently biased to snugly hold the mounting strap between said tabs and said U-shaped member.

3,885,848
ELECTRICAL CONNECTION AND METHOD OF MAKING SAME

Harold A. Brouneus, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 3, 1974, Ser. No. 475,664
Int. Cl. H01r *11/22*
U.S. Cl. 339—17 C 10 Claims



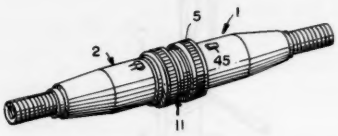
1. In an electrical contact member for making an electrical connection with an electrically conductive flat surface and including a volute helix of electrically conductive resilient wire including a succession of spirals progressively increasing in size such that each succeeding spiral will surround the preceding spirals when the helix is compressed against said flat surface, the combination therewith of an electrical connection with said contact member, such connection comprising; a cylindrical helix of electrically conductive resilient wire having a first end electrically connecting with the end of the smallest one of said spirals of said volute helix and a second end at the opening into the free end of such cylindrical helix; an electrically conductive terminal member including a first portion for connecting an electrical conductor to such terminal member and a longitudinal shank portion extending from said first portion of the terminal member, and having a generally circular outer periphery which tapers from said first portion towards the end of said shank portion of the terminal member with an intermediate region of such shank portion having a diameter corresponding in diameter to said opening in said free end of said cylindrical helix such shank portion of the terminal member being inserted through such opening and into the cylindrical helix with said intermediate region of the shank portion frictionally engaging the inner periphery of the end spiral of the cylindrical helix at said free end thereof, whereby said terminal member can then be manually rotated to partially and temporarily unwind some of the spirals of the cylindrical helix while simultaneously further inserting the shank portion of the terminal member into the cylindrical helix for frictional engagement between the shank portion of

the terminal member and the inner peripheries of additional spirals of the cylindrical helix.

3,885,849
ELECTRICAL CONNECTORS WITH INTERCHANGEABLE COMPONENTS

James R. Bailey, Chicago, and Vernon W. Lavigne, Rolling Meadows, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Mar. 8, 1973, Ser. No. 339,050
Int. Cl. H01r *13/48*
U.S. Cl. 339—31 R **4 Claims**



1. An electrical connector comprising two housings each having a tubular opening therein, a pair of mating molded male and female inserts each interchangeably receivable in said openings, latch means associated with said inserts and said housings for holding each insert in its respective opening after it has been inserted, and means operable from the exterior of said housings for releasing said latch means to permit withdrawl of each said insert from its respective opening, said connector comprising coupling means to connect said housing together independently of said inserts and comprising a rotatable internally threaded ring mounted on one of said housings, the threads of which are engageable with external threads mounted on the other of said housings, said ring being slidable axially on said housing a predetermined distance so as to project beyond said opening, said distance in an outward direction with respect to said opening being limited by the inner side of an inwardly extending flange on the inner end of said ring contacting an outwardly extending flange adjacent the end of said housing and in an inward direction by an outwardly extending portion of said housing contacting the outer side of said flange on said ring, said outwardly extending portion comprising at least one cut resilient portion of said housing.

3,885,850
CONTROLLED RETENTION FORCE CONNECTOR WITH DETENT

Roy Witte, Rolling Meadows; Edward Kirby, Morton Grove, and George Mack, Roselle, all of Ill., assignors to TRW Inc., Cleveland, Ohio

Filed Mar. 5, 1973, Ser. No. 338,332
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R **30 Claims**

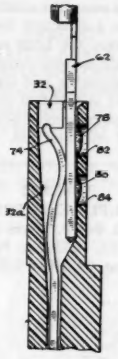
1. An improved electrical connector device adapted to define electrical contact between pre-determined electrical circuits wherein high retention forces are defined between the mating connector units of said device securing them in assembled relation to prevent unintended separation, the device comprising:

a female connector unit defined in part by an insulating body with said body having walls defining a row of spaced apart contact receiving recesses therein for receiving a male contact element in each recess along an insertion axis;

an electrical contact element mounted within each recess in said insulating body of the female connector unit;

the insulating body having associated with one of its walls which extends longitudinally of the row a plurality of discrete locking means in each contact receiving recess which are spaced apart theron along the insertion axis and adapted to interengage with locking means on a mating male contact element of the device, and

a mating male connector unit defined in part by an insulating body having at least one male contact element mounted within said body, said male connector unit adapted for mating operative engagement with said female connector unit by insertion along the insertion axis of a male contact element into a recess in the female

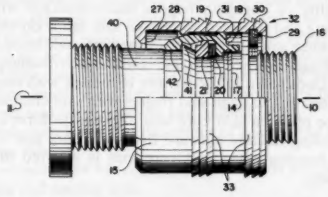


insulating body to bring the contact elements of each of said units into physical contact to define electrical engagement therebetween, a plurality of discrete locking means on the male contact element spaced apart along the insertion axis to interengage with the locking means on the insulating body of the female connector unit to define interlocking engagement therebetween and between said male and female units to secure them in assembled, mating relation.

3,885,851
PUSH-PULL CONNECTOR

Jeffrey Bennett, Herne Bay, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 20, 1973, Ser. No. 371,948
Claims priority, application United Kingdom, June 26, 1972, 29870/72
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R **8 Claims**



1. A connector comprising first and second parts arranged for relative longitudinal push-pull movement along an axis into and out of connection with one another, the first part having a mounted retaining member and a latch comprising a resilient tine with a cantilevered end including a latch surface and a cam surface, means for resiliently biasing the mounted retaining member into a first position in which it prevents the tine from moving into a locking position with said retaining member having a second position into which it is moved against the resilient bias by the action of mating the first and second parts, the tine being free to move into the locking position when the retaining member is in the second position, the second part having a latch surface, one of the parts having

a movable locking member with a cam surface engaging the cam surface of the latch to prevent movement of said locking member in one direction relative to the latch when said retaining member is in said first position, said locking member movable in a push movement in said one direction with said first part relative to said second part to mate said first part to said second part for moving said retaining member to said second position whereafter the cam surface of the locking member is movable in said one direction against the cam surface on said latch to move the cantilevered end of the tine against its resilience in a direction toward the axis into the locking position to cause the latch surface on said tine to engage the latch surface on said second part, and means on said locking member engaging said latch in response to said retaining member being in said first position for holding said locking member against movement relative to said latch in a direction opposite said one direction.

3,885,852

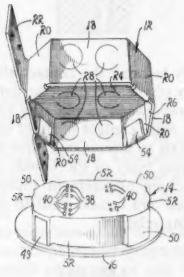
QUICK COUPLE ELECTRIC OUTLET

Edward H. Grove, P.O. Box 8, Morro Bay, Calif. 93442

Filed Oct. 24, 1973, Ser. No. 409,260

Int. Cl. H01r 9/06

U.S. Cl. 339—95 D **10 Claims**



1. An electrical wall unit assembly comprising:

a housing having a generally symetrical periphery and mounting means disposed for mounting said housing in the wall of a building;

a core unit having a periphery mated to the periphery of said housing for insertion and rotation therein, said core unit periphery having a plurality alternately disposed of lands and channels;

a plurality of engaging fingers interconnected with said housing and disposed to engage said lands on said core unit when said core unit is inserted into said housing with said fingers aligned with said lands, and to disengage from said lands when said core unit is rotated with respect to said housing to align said fingers with said channels; and a face plate on said core unit disposed to form a flange extending radially outward from said core unit to close said housing when said core unit is inserted into said housing.

3,885,853

SPRING CLIP WIRE TERMINATING ARRANGEMENT

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 7, 1974, Ser. No. 431,187

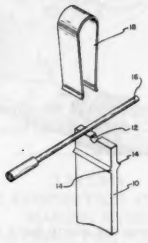
Int. Cl. H01r 9/08

U.S. Cl. 339—97 R **6 Claims**

1. A wire termination apparatus comprising:

a terminal post having an end portion about which said wire is terminated, a U-shaped spring clip formed of flat spring material having configuration complementary to that of and disposed over said terminal post, and operative to dress said wire against opposed sides of said terminal post and compress said wire against said post with a preselected force, and

wire locating means comprising a notch disposed in the opposed surfaces of said spring clip which compress said wire against said post, means for positively locating said spring clip with respect to the end of said terminal post to thereby positively locate said wire with respect to the end of said terminal post, and a vertical extension disposed on said spring clip, having a cross section configuration substantially identical to that of said terminal post, and having an end portion about which a second wire is terminated, a second substantially identical spring clip disposed over said vertical extension, operative to dress said second wire against opposed sides of said vertical extension, and compress said second wire against said vertical extension with a preselected force.



3,885,854

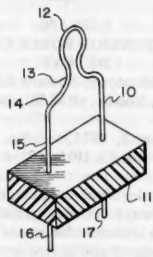
LOOP SHAPED CIRCUIT TEST POINT

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 5, 1974, Ser. No. 476,482

Int. Cl. H01r 9/16

U.S. Cl. 339—218 M **7 Claims**



1. A loop-shaped circuit test point constructed of electrically conductive wire comprising: a head shaped portion forming the top of said test point; a body portion consisting of two legs, the uppermost portion of said body converging to form a shoulder portion; a neck portion coupling said shoulder portion to said head portion, each of said legs following a diverging path from said shoulder portion, the lower portion of each of said legs passing through a rigid base on a slightly converging path and passing through and beyond said base essentially parallel to each other, to form circuit connecting terminals.

3,885,855
FILTERING ANTISOLAR AND HEAT INSULATING GLASS

Daniel M. Gross, Carouge, Geneva, Switzerland, assignor to Battelle Memorial Institute, Switzerland

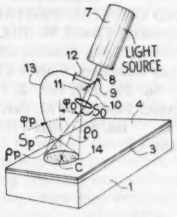
Filed Aug. 10, 1972, Ser. No. 279,472
Claims priority, application Switzerland, Aug. 16, 1971, 11990/71
Int. Cl. G02b *5/20*
U.S. Cl. 350—1 **37 Claims**

1. Filtering antisolar and heat insulating glass, comprising a support including at least one panel of light-transmitting material capable of transmitting at least a part of the spectrum of visible light, and at least one coalescent layer of filtering material applied to and adhering on at least one face of the panel, said filtering material comprising at least one compound selected from the borides, carbides, nitrides, carbonitrides and suboxides of at least one of the following metals: titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum and tungsten, and wherein the electric resistance of a square-shaped part of said layer of filtering material, having a thickness of between 200 and 1000 A, has an electrical resistance at most equal to 200 Ohms at ambient temperatures and 400 Ohms at −195°C.

3,885,856
HOLOGRAPHIC COUPLER FOR OPTICAL WAVEGUIDES

Daniel Ostrowsky; André Jacques, and Michel Papuchon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 1, 1973, Ser. No. 365,976
Claims priority, application France, June 7, 1972, 72.20423
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **6 Claims**



1. A method for manufacturing a coupling device for an optical waveguide;

said coupling device being capable of conjugating a non-plane electro-magnetic wave of wavelenght λ_1 propagating outside said waveguide and a substantially plane electromagnetic wave propagating at an angle inside said waveguide and comprising at least one hologram arranged on a face of said waveguide;

said method consisting in arranging on said face a layer of photosensitive material and in recording a hologram in at least one region of said layer;

said hologram resulting from the interference of a first and a second recording electromagnetic wave of wavelenght λ_φ;

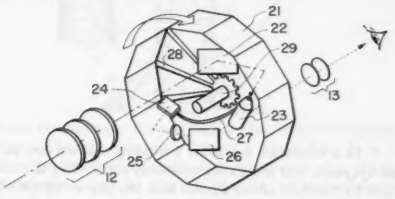
said first recording wave being substantially spherical and said second recording wave having a position in relation to said waveguide and wave fronts substantially identical to the position and the wavefronts of said non-plane electromagnetic wave.

the center of said spherical first recording wave being positioned for said hologram to conjugate said non-plane wave propagating outside said waveguide and said substantially plane wave propagating inside said waveguide.

3,885,857
CONVERGENT BEAM SCANNER WITH MULTIPLE MIRROR DEFOCUS COMPENSATION

William S. Flogaus, Alexandria, and Mitsumasa Masutani, Ft. Belvoir, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1973, Ser. No. 408,978
Int. Cl. G02b *17/00*
U.S. Cl. 350—7 **6 Claims**



1. An optical system comprising:

an objective lens means having a first optical axis for forming a convergent focused beam of light from a distant radiating object;

a first plane deflection mirror mounted at a first point on said first axis and inclined thereto to redirect said beam to a second point in a reference plane normal to said first optical axis;

a plurality of plane scanning mirrors symmetrically mounted in fixed relative positions at a fixed radial distance parallel to and facing a second axis, the center of one of said scanning mirrors coinciding with said second reference point;

a linear array of optical detectors mounted in fixed relative position to said objective lens and said first and second points with the centers of their active faces in a first radial plane through said second axis, the normal to the center of said array passing through said second reference point making an acute angle of at least several degrees with the straight line through said first and second points, said acute angle being approximately bisected by the normal from said second axis to said second point;

a third point located at the center of a second of said scanning mirrors;

an eyepiece lens having a third optical axis parallel to said first and second axis;

a second deflection mirror centered on said third axis and inclined thereto to reflect a light ray from said third point to said third axis;

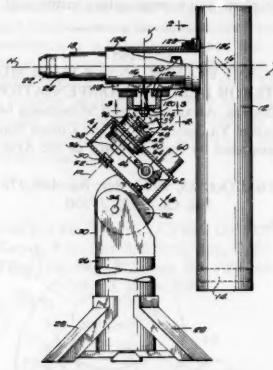
a linear array of light emitting elements having their centers in a second radial plane through said second axis and having a central normal which passes through said third point, said light emitters being electronically coupled to said detector elements, with said lenses, deflection mirrors, and arrays being in fixed relative positions to one another and the spacing of said first and third axes from said second axis being equal and less than said fixed radial distance to said scanning mirrors; and

means for rotating said scanning mirrors relative to said relatively fixed elements about said second axis.

3,885,858
TELESCOPE MOUNTING

Victor R. Hildemann, 1647 Minnesota St., Oshkosh, Wis. 54901

Filed Nov. 14, 1973, Ser. No. 415,909
Int. Cl. G02b 23/16
U.S. Cl. 350—83 8 Claims

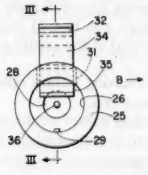


1. In a telescope assembly including a telescope tube with an eyepiece and means for rotatably supporting the telescope tube for rotation about a polar axis, the improvement comprising means for rotatably supporting the telescope tube for rotation about a vertical axis, and means for rotatably supporting the telescope tube for rotation about a horizontal axis, said telescope tube having an eyepiece tube projecting laterally from one side threrof, said eyepiece tube being strong enough to support said telescope tube, and wherein said means for supporting the telescope tube for rotation about a horizontal axis comprises a horizontal tube which is dimensioned to rotatably embrace said eyepiece tube, said horizontal tube being supported by said means for supporting the telescope tube for rotation about a vertical axis.

3,885,859
OPTICAL FIBRE CONNECTORS

Jack Frank Dalgleish, Ottawa, and Helmut Hans Lukas, Carleton Place, Ontario, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed June 24, 1974, Ser. No. 482,211
Int. Cl. G02b 5/14
U.S. Cl. 350—96 C 10 Claims

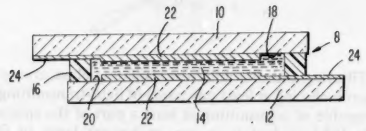


1. An optical fibre connector for connecting pairs of optical fibres in accurate end to end relationship comprising:
- a first holding member for holding one of a pair of fibres and a second holding member for holding the other of said pair of fibres;
- at least one locating member extending from one of said holding members for cooperation with the other of said holding members for axial end to end location of said holding members;
- at least one groove in said locating member, said groove extending in a direction parallel to the longitudinal axis of the connector;
- means for retaining said holding members in opposed assembled relationship;
- means in each member for acceptance of at least one optical fibre, the fibres in end-to-end abutting relationship adjacent said locating member;
- resilient means for urging the ends of said fibres into said groove.

3,885,860
FABRICATION OF LIQUID CRYSTAL DEVICES

Howard Sorkin, Berkeley Heights, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,233
Int. Cl. G02f 1/28, 1/36
U.S. Cl. 350—160 LC 5 Claims

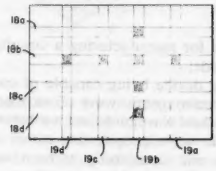


1. A method of fabricating a liquid crystal device comprising:
- providing on each of two spaced apart surfaces of a device enclosure an electrode,
- vapor depositing, using a small vapor deposition angle, an inorganic material on at least one of said electrodes to provide on said one electrode a surface along which the molecules of a liquid crystal material sympathetically align, the aligning characteristic of said electrode surface not being disrupted when said electrode surface is exposed to a first temperature,
- hermetically sealing together portions of said enclosure with a fused joint formed at said first temperature, said electrode surface being heated to said temperature in the process, and
- introducing a liquid crystal material into said enclosure and into contact with said electrode surface.

3,885,861
LIQUID CRYSTAL DIGITAL RETICLE

Robert P. Farnsworth; Lowell W. Hill, both of Los Angeles, and Shi-Yin Wong, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 293,978, Oct. 2, 1972, abandoned. This application June 5, 1974, Ser. No. 476,499
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 1 Claim



1. The method of operating a liquid crystal cell comprising the steps of:
- a. positioning a first set of incrementally spaced transparent conductors on one interior face of said cell in spaced orthogonal relationship to a second set of incrementally

spaced conductors on the opposite parallel interior other face of said cell;

b. completing an electrical energizing circuit between only a preselected one of said first set of conductors and a preselected one of said second set of conductors; and

c. maintaining the voltage difference between said preselected conductors at a magnitude greater than the half voltage required to cause turbulence of the liquid crystal material only in the projective intersection volume of said energized conductors to thereby cause turbulence at a plurality of other points along the length of each of said energized conductors by cross coupling.

3,885,862

ZOOM LENS

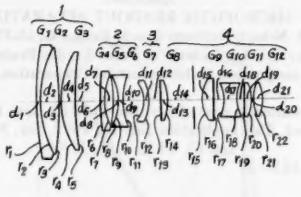
Yoshisato Fujioka, and Tetsuro Ishizuka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Yashica, Japan

Filed Oct. 5, 1973, Ser. No. 403,830

Claims priority, application Japan, Oct. 9, 1972, 47-101150

Int. Cl. G02b *15/00, 9/00*

U.S. Cl. 350—186 **8 Claims**



1. In a zoom lens having a front end to be directed toward an object to be photographed and a rear end to be directed toward an image plane of a camera, first means situated at said front end for carrying out an image-composing function with respect to a finite object, second means situated behind said first means for varying magnification, said first and second means having a common optical axis and being movable therealong, third means situated along said optical axis behind said second means and being movable therealong for compensating for a change in focal point produced by movement of said second means along said optical axis, and fourth means situated behind said third means along said optical axis for composing an image, said fourth means being fixed with respect to said optical axis, said first means including a first lens group of positive refracting power and consisting of three lens members which include from the front toward the rear a first negative meniscus lens having a forwardly directed convex surface, a second positive lens having a forwardly directed convex surface of greater curvature than its rearwardly directed convex surface, with said forwardly directed convex surface of said second lens contacting the rear surface of said first lens for providing a focusing function therewith, and a third positive meniscus lens having a forwardly directed convex surface, said second means including a second lens group having a negative refracting power and consisting of three lens members forming the fourth, fifth, and sixth lens, respectively, of the zoom lens, said fourth lens being a negative meniscus lens having a forwardly directed convex surface, said fifth lens being a positive meniscus lens having a rearwardly directed convex surface of greater curvature than its forwardly directed surface, and said sixth lens being a negative lens whose concave forwardly directed surface is of greater curvature than its rearwardly directed surface, said fifth and sixth lenses engaging each other and having a diverging function, said third means including a third lens group having a negative refracting power and consisting of a negative meniscus lens having a forwardly directed concave surface, said fourth means including a fourth lens group having a positive refracting power and consisting of four positive lens members and at least one negative lens member.

3,885,863

PRISM ARRANGEMENT

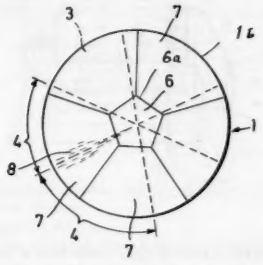
Arnold Mellert, Eltville, Germany, assignor to B & W. Filterfabrik Johannes Weber KG, Wiesbaden, Germany

Filed Jan. 29, 1973, Ser. No. 327,585

Claims priority, application Germany, June 28, 1972, 2410000

Int. Cl. G02b *3/00*

U.S. Cl. 350—196 **6 Claims**



1. Prism arrangement for use with a photographic camera, comprising a transparent prism having a planar base face, a circular edge face and an outer face composed of a planar central polygonal top face and a plurality of slanted faces extending between said planar central polygonal top face and said circular edge face of said prism; a planar transparent colored layer superimposed on said planar base face of said transparent prism and composed of a plurality of sector shaped portions having different colors and apexes meeting in the center of said prism, at least some of said differently colored sector shaped portions overlapping two adjacent ones of said slanted faces of said transparent prism; and a planar transparent plate of uniform thickness covering said planar transparent colored layer.

3,885,864

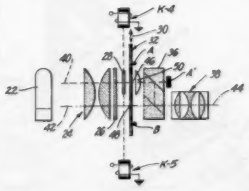
METHOD OF AND APPARATUS FOR PROJECTING SPLICED FILM OR TAPE

Dietrich P. Friesen, 205 Queen Mary Dr., Apt. 205, Oakville, Ontario, Canada

Filed Jan. 14, 1974, Ser. No. 432,971

Int. Cl. G03b *9/08*

U.S. Cl. 352—204 **7 Claims**



1. In an apparatus for projecting a spliced film or tape having picture frames and a spliced frame, the combination of:

a. projection means for projecting successive ones of said picture frames as they are moved into a projecting position;

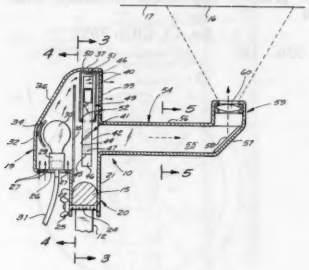
b. means for preventing projection of said spliced frame when it is in said projecting position and for projecting an adjacent frame instead; and

c. means sensing the presence of said spliced frame in said projecting position.

3,885,865
AUTOMATIC KALEIDOSCOPE

Philip Stern, 200 E. 27th St.; Sanford Green, 230 W. 59th St., and Isaac Goodbar, 409 E. 60th St., all of New York, N.Y. 11207

Filed Nov. 14, 1973, Ser. No. 415,782
Int. Cl. G03b *21/00*
U.S. Cl. 353—2 **7 Claims**

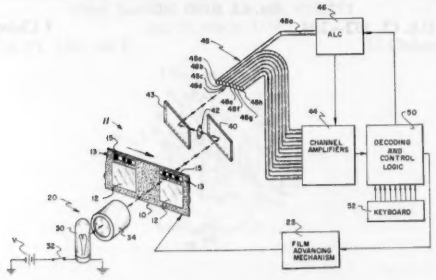


1. Automatic kaleidoscope, comprising a lamp housing, a lamp in the housing, the housing having air inlet means to admit ambient air into the housing and air outlet means to permit the exhausting from the housing of air heated by the lamp, a rotatable hollow disc-like wheel having spaced transparent opposite sides and a peripheral rim mounted in the housing, the wheel having vanes mounted thereon and positioned in the path of heated air being exhausted from the housing to turn the wheel thereby, a quantity of particulate material disposed in the wheel to be tumbled repeatedly as the wheel rotates, and a kaleidoscope mirror trough disposed to receive light from the lamp after it has passed through the wheel from side to side at the location of the tumbling particulate material.

3,885,866
COMPENSATION APPARATUS FOR IMPROVED MICROFILM CODE FIELD READING

Richard D. Stearns, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,749
Int. Cl. G03b *21/20, 21/11, 23/12*
U.S. Cl. 353—26 **2 Claims**



1. In automatic retrieval apparatus including a code field reading station, means for moving an information bearing medium having at least one image and an identification code field disposed adjacent thereto to position such code field in said reading station, the code field having a plurality of information bit positions having relatively low (i.e., transparent) and/or high (i.e., opaque) optical densities respectively, and a light source for illuminating the code field, the improvement comprising:

a. a plurality of photocells disposed relative said reading station and arranged so as to correspond to bit positions of a code field positioned in said station, respectively, said plurality of photocells being responsive to light from said source for producing signals having relative levels indicative of the relative optical densities of corresponding bit positions, respectively;

b. automatic light control circuitry having (i) another photocell disposed relative to said reading station and arranged to produce a signal corresponding to the intensity of light passing through low optical density bit positions of the code field; and (ii) memory storage means responsive to the signal produced by said another photocell for producing a reference signal;

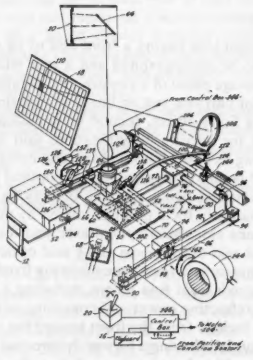
c. means responsive to said reference signal and said plurality of optical density indicating signals for producing digital signals representative of the relatively low or high contrast of said bit positions, respectively; and

d. logic and control means responsive to said digital signals for determining when a code field having a desired information is at said reading station.

3,885,867
MICROFICHE READOUT APPARATUS

Alfred M. Nelson, Redondo Beach; Robert G. McPherson, and Maurice S. Martin, both of Palos Verdes Peninsula, all of Calif., assignors to Cubic Industrial Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 219,103, Jan. 19, 1972, abandoned. This application July 17, 1972, Ser. No. 272,193
Int. Cl. G03b *1/52, 23/08*
U.S. Cl. 353—27 **5 Claims**



1. Microfiche card readout apparatus for providing a readout of an individual one of a plurality of frames arranged on the card in rows and columns, the apparatus comprising:

a support for holding the card in a plane for readout, the support having an opening at a readout position for passage of light through the card,

clamp means for holding the card for movement over the support,

positioning means connected to aid clamp means for moving the card along orthogonal X and Y axes,

control means coupled to said positioning means for positioning the card with a selected individual frame at the readout position,

said positioning means including a pair of fixed orthogonal guide rods each having a block member slidably mounted thereon, each block member having a positioning rod extending therefrom perpendicular to the respective guide rod;

a follower block slidably mounted on both of said positioning rods for motion along X and Y axes, the positioning rods being orthogonally slidable through and supporting said follower block;

and said clamp means comprising a card engaging jaw pivotally secured to said follower block.

3,885,868

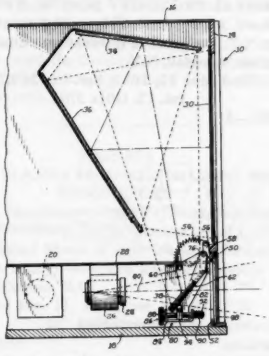
CONVERTIBLE PROJECTOR WITH DOOR ACTUATED MIRROR

Theodore M. Hadzimihalis, Libertyville, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 29, 1974, Ser. No. 456,327

Int. Cl. G03b 21/28, 21/30

U.S. Cl. 353—71 2 Claims



1. In a film image projection apparatus convertible for projection of an image alternatively onto a remote surface and a built-in screen, the apparatus having projection means substantially enclosed within a housing and defining a projection path, the improvement comprising:

projection path blocking means adjustable about a first axis to open and closed positions, and being positioned substantially in a plane parallel with said built-in screen when in said closed position;

mirror means mounted for pivotable movement about an axis parallel to said blocking means supporting axis;

means coupling said blocking means and said mirror means for simultaneous displacement between projection path closed, image blocking condition and projection path open, image passing condition, said coupling means including:

over-center spring means for positive displacement of said blocking means and said mirror means from a first predetermined position;

adjustable means for orienting said mirror means when said blocking means is in said image path closed position; and limit means for determining one of said predetermined positions of said blocking means.

3,885,869

ELECTROPHOTOGRAPHIC COPYING MACHINE

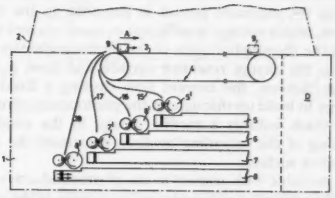
Paul Monamy James, London, England, assignor to Imaging Technology Limited, Middlesex, England

Filed Apr. 8, 1974, Ser. No. 458,803

Claims priority, application United Kingdom, Apr. 10, 1973, 17074/73

Int. Cl. G03g 15/00

U.S. Cl. 355—3 R 3 Claims



1. An electrophotographic copying machine comprising

a. an exposure station,

b. a development station,

c. at least one reservoir for electrophotographic substrate material,

d. conveying means for supporting the substrate material at the exposure station and for moving the material to the development station,

e. a charging unit movable across the exposure station and disposed above the conveying means,

f. automatic feed means for drawing material from a reservoir and feeding it to the upstream end of the conveying means, and

g. logic circuit means for energising the charging unit either when stationary at said upstream end during passage of material below it or when moving across stationary material in the exposure station.

3,885,870

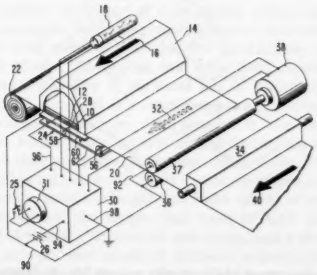
DEVICE FOR DISCHARGING CHARGE ACCUMULATED BETWEEN THE RECORDING MEDIUM AND A PHOTOCONDUCTIVE PLATE IN AN ELECTROPHOTOGRAPHIC RECORDER

Raymond L. Levy, Mountain View, and Gene F. Day, Los Altos, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Nov. 2, 1973, Ser. No. 412,238

Int. Cl. G03g 15/00

U.S. Cl. 355—14 9 Claims



1. An electrophotographic recorder responsive to an image to be recorded for providing an image on the charge retentive surface of a recording medium having a conductive backing, comprising:

cycling means for defining a recording medium engagement period, an image exposure period, a recording medium disengagement period, and a discharge period for discharging accumulated net charge prior to the complete disengagement of the recording medium;

a photoconductive member which is selectively illuminated by the image to be recorded during the exposure period while engaging the charge retentive surface of the recording medium;

means for applying a charge transfer voltage across the photoconductive member and the recording medium during the exposure period in response to the cycling means, which voltage is sufficient to cause current to flow from the illuminated areas of the photoconductive member to the charge retentive surface and form a charge image thereon, the current flow causing a fixed space charge to build up throughout the photoconductive member which induces a mobile charge in the conductive backing of the recording medium proximate the charge retentive surface;

means movable with respect to the photoconductive member for urging the charge retentive surface of the recording medium into engagement with the photoconductive member during the engagement period, and for maintaining this engagement throughout the exposure period, and for disengaging the recording medium from the photoconductive plate during the disengagement period; and

conductive means responsive to the cycling means for establishing electrical communication between the conductive backing of the recording medium and the photoconductive member during the discharge period for permitting the induced mobile charge on the recording medium to flow into the photoconductive member and neutralize the fixed charge in the photoconductive member; said conductive means comprising:

a first conductive drive roller which engages the conductive backing of the recording medium for moving the recording medium with respect to the photoconductive plate after completion of the disengagement period; and

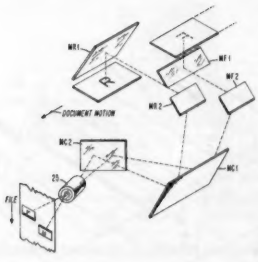
a switch responsive to the cycling means for electrically connecting said first conductive drive roller to the photoconductive member.

3,885,871

DOCUMENT PHOTOGRAPHY SYSTEM

Matthew J. Galatha, Vestal, and Richard F. Tynan, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1974, Ser. No. 460,321
Int. Cl. G03b *27/32*
U.S. Cl. 355—23 **1 Claim**



1. In a document photography system for photographing on a photographic film both front and rear sides of elongate documents traveling serially and end to end, the combination comprising a reduction lens system, a first set of fixed mirrors aligned to reflect the image of the front side of one of said documents to be photographed to said lens system, and a second set of fixed mirrors aligned to reflect the image of the reverse side of the document to be photographed to said lens system, said lens system and said mirrors being aligned to project said images on the film surface which are aligned with respect to a common reference line,

said common reference line being perpendicular to the length of the film, with the images having their long sides parallel to said reference line and having the orientation of said first and second set of fixed mirrors such that the images generated by the documents being fed end to end serially are presented transverse to the image receiving surface of the film,

document transport means for conveying said documents serially and end to end past said first and said second sets of mirrors,

film advancing means for feeding said photographic film,

width sensing means for indicating the width of documents as they are fed through the system, and

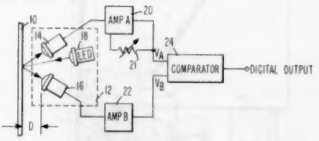
means governed by said width sensing means for advancing the film in increments proportional to the width of the documents being photographed.

3,885,872

DIGITAL PROXIMITY SENSING SYSTEM

James J. Howe, Jr., Portland, Oreg., and James C. Yarrington, Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 12, 1973, Ser. No. 369,378
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 **4 Claims**



1. A proximity sensor comprising:

a light source,

first and second photosensitive elements responsive to light from said source reflected from an object,

said first photosensitive element being positioned to receive light from said source directly reflected from said object, said second photosensitive element being positioned to receive light from said source diffusively reflected from said object, and

means for comparing outputs from said photosensitive elements to obtain an indication of proximity, wherein said photosensitive elements have differing output characteristics with respect to displacement between said photosensitive elements and said object, said characteristics each comprising a voltage-displacement relationship in which the voltage decreases with respect to increase in displacement, said characteristics having an intersection with each other at a nominal predetermined displacement from said object.

3,885,873

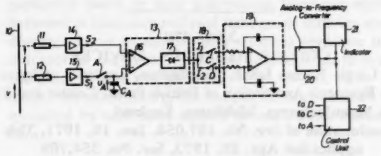
DEVICE FOR MEASURING THE RELATIVE MOVEMENT BETWEEN TWO OBJECTS

Nils Ingvar Andermo, Taby, Sweden, assignor to Stiftelsen Institutet for Mikrovagsteknik Vid Teknishka Hogsk-lan i Stockholm, Stockholm, Sweden

Filed Dec. 12, 1972, Ser. No. 314,320
Int. Cl. G01p *3/36*
U.S. Cl. 356—28 **4 Claims**

1. A device for measuring the relative movement between two objects, comprising two sensors mounted on one of said objects in spaced-apart positions along the direction of relative motion between said objects to sense irregularities on the

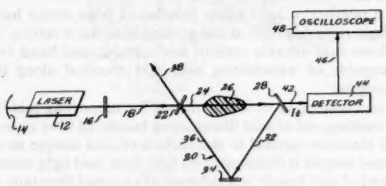
other object and generate two signals of substantially equal shape, but displaced in time as a function of the relative speed between the two objects, sampling means for periodically sampling one of said signals and storing the sampled signal value, comparison means for comparing the stored signal value with the other signal and forming a differential signal, a switch unit means for alternately and periodically supplying the differential signal to opposite polarity inputs of an integrator during two selected time intervals, a voltage-to-frequency converter supplied with the output signal from the integrator and arranged to generate a frequency signal, and a control unit means supplied with said frequency signal for controlling the operation of the sampling means and the switch unit means so as to cause the frequency of the output signal from the converter to become proportional to the relative speed between said objects.



3,885,874
LASER PLASMA DIAGNOSTIC USING RING RESONATORS

Roger A. Haas, Manchester; Peter P. Chenausky, Farmington, and Robert J. Freiberg, South Windsor, all of Conn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 11, 1974, Ser. No. 434,528
Int. Cl. G01b *9/02*
U.S. Cl. 356—107 **10 Claims**



1. Apparatus for measuring the change in the average electron density of a plasma comprising:

a. means for producing a laser beam;

b. ring resonator means independent of the aforesaid means for receiving said laser beam and propagating the same in a closed system without reflecting laser light into said means for producing said laser beam;

said ring resonator means containing at least a portion of said plasma so that said laser beam continuously circulates cyclically through said portion of said plasma;

successive portions of said laser beam interfering with the circulating laser beam;

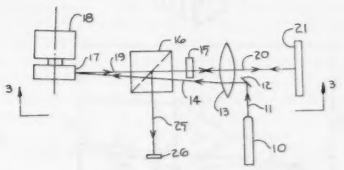
c. means for extracting circulating laser light from said ring resonator means; and

d. means for presenting the fringe pattern of the extracted laser light, the spacing in said pattern indicating the rate of change of the electron density of said plasma.

3,885,875
NONCONTACT SURFACE PROFILOMETER

Alvin H. Rosenfeld, Cromwell, and Carl A. Zanoni, Middletown, both of Conn., assignors to Zygo Corporation, Middlefield, Conn.

Filed July 29, 1974, Ser. No. 492,781
Int. Cl. G01b *11/30*
U.S. Cl. 356—120 **4 Claims**



1. A device for measuring the surface profile and the first derivative of the surface profile of a basically flat reflecting object (comprising) (1) a source of radiant energy, and means to produce a narrow collimated beam therefrom; (2) means for focusing said beam onto a uniformly rotating reflective surface to produce a reflected beam on axis with; (3) means for recollimating said reflected beam to produce a linearly scanned beam which is scanned across the surface of said test object and reflected therefrom; (4) means for collecting said beam reflected from said test object and focusing it onto (5) a photoelectric position sensor; (6) means for processing the output of said position sensor to yield an output indicative of the first derivative of the surface profile of the test article along the line of intersection of said linearly scanned beam and the surface of the test object; (7) means for processing said first derivative output to produce an output indicative of the surface profile of the test article along said line of intersection and (8) means for processing the output of said position sensor in order to assure that said first derivative and surface profile outputs are independent of the tilt or alignment of the surface of the test article relative to the apparatus.

3,885,876
OPTICAL CHROMATIC DISPLAY FOR NAVIGATIONAL GUIDANCE

John P. Konopka, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 26, 1973, Ser. No. 427,497
Int. Cl. G01b *11/26*
U.S. Cl. 356—153 **6 Claims**

1. An optical device for providing a visual chromatic display for guiding an observer along a prescribed path of travel comprising:

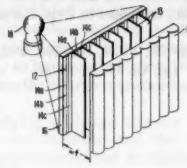
a lens system comprised of cylindrically ribbed lenticulars and having its aperture oriented toward said observer,

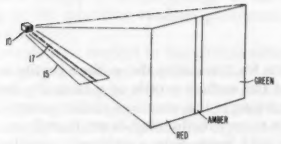
a color field member positioned at substantially the focal point of said lens system, said color field member comprising a plurality of identical sets of translucent color materials arranged in a repetitive pattern and occupying homologous positions with respect to the cylindrical lenses which make up said ribbed lenticulars and with which they are respectively associated, each of said sets including a plurality of colors and having substantially the same dimensions in length and width as one of said cylindrical lenses, the longitudinal axes of said sets being parallel with the rib axes of said lenses, and a plurality of opaque vane-like members situated respectively at the interstices of adjacent sets and projecting outward toward said lenticulars,

a light source positioned with respect to said color field member to provide for the back-lighting thereof,

said lens system forming an image of said illuminated color field member which encompasses said entire lens aper-

ture and which appears generally to said observer as one of said plurality of colors depending upon the observer's





line of sight to said lens aperture, observation of a preselected one of said colors being indicative of the observer's alignment with said presecribed path of travel.

3,885,877

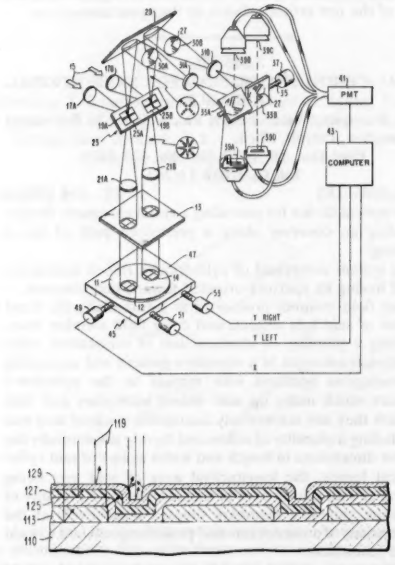
ELECTRO-OPTICAL FINE ALIGNMENT PROCESS

Ronald S. Horwath, Salt Point, and George A. Kolb, Wappinger Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1973, Ser. No. 405,347

Int. Cl. G01b *11/26*

U.S. Cl. 356—172 **9 Claims**



1. In a process for aligning two objects by electro-optical means in which each of said objects have corresponding alignment patterns with the patterns on one of said objects being in the form of a relief image which is coated with a layer of photoresist; the alignment being accomplished by illuminating said patterns with coherent monochromatic light which is reflected from said relief image to produce images of said corresponding patterns; using said images to produce electrical signals which are indicative of the location of said patterns; and moving the objects relative to one another until the signals agree, the improvement which comprises coating on said resist layer a layer of material prior to illuminating said patterns which material absorbs and reflects said light such that only light reflected from said layer is used to generate said signals.

3,885,878

COLOUR MEASURING DEVICES

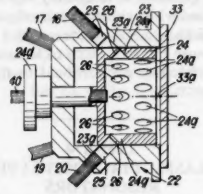
Ishak Girgis Hanna Ishak, Teddington, England, assignor to The Research Association of British Point, Colour and Varnish Manufacturers, Middlesex, England

Continuation of Ser. No. 107,054, Jan. 18, 1971. This application Apr. 26, 1973, Ser. No. 354,709

Claims priority, application United Kingdom, Jan. 19, 1970, 2520/70

Int. Cl. G01j *3/50*

U.S. Cl. 356—176 **6 Claims**



1. A colorimeter for determining the color of a sample comprising:

a. a stabilized light source;

b. a sensing head;

c. an illuminating bundle of fibre optics extending between said light source and said sensing head and having a light receiving end adjacent said light source and a light emitting end at said sensing head for illuminating a discrete area of said sample;

d. a number of light guide bundles of fibre optics having light receiving ends at said sensing head for receiving light from said discrete area of said sample, said bund being capable of transmitting said light received along their lengths;

e. said sensing head having means for supporting said light emitting end of said illuminating bundle of fibre optics in a direction normal to the surface of said sample so that said sample is illuminated by light from said light emitting end of said bundle in a substantially normal direction, and for supporting said light receiving ends of said light guide bundles of fibre optics so that they are at an angle of 45° to said light emitting end of said illuminating bundle of fibre optics and are evenly spaced around the light emitting end of said bundle of fibre optics;

f. means for maintaining the surface of said sample normal to said light emitting end and at an angle of 45° to each of said light receiving ends, whereby said light emitting end illuminates said discrete area substantially normally and said light receiving ends receive light from said illuminated discrete area at an angle of about 45° to the normal to said surface;

g. a light detector to which light transmitted by said light guide bundles is conducted for determination of the sum of said light transmitted by said bundles;

h. subtractive filter means for filtering at least part of said light transmitted by said light guide bundles and conducted to said detector so as to modify the spectral response of said detector to one color function, said filter

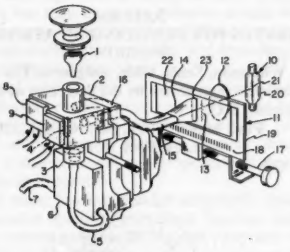
means including individual light subtractive filters for filtering light passing through at least one light guide bundle, and said filter means comprising adjacent relatively rotatable supporting members respectively having ports extending through the members which can be brought into mutual registration by relative rotation, said light guide bundles terminating in the ports of one of said members, and at least some of the ports in the other member supporting filters therein, and means for rotating said members one with respect to the other so as to align particular ports in mutual registration, such alignment of particular ports in turn interposing filter arrangements between at least some of said light guide bundles and said detector so as to modify said spectral response to said detector to each color function in turn so as to measure the color of said sample, and

i. means for determining the output of said detector when modified by said filter means to each color function in turn.

3,885,879
DUAL BEAM SPECTROPHOTOMETER UTILIZING A SPECTRAL WEDGE AND BIFURCATED FIBER OPTIC BUNDLE

Nevitt M. Louder, Verona, and Warren G. Gillingham, Pittsburgh, both of Pa., assignors to Fisher Scientific Company, Pittsburgh, Pa.

Filed June 25, 1973, Ser. No. 372,931
Int. Cl. G01j *3/48, 3/42*
U.S. Cl. 356—189 **9 Claims**



1. A spectrophotometer comprising:

A. a source of light;

B. an adjustable wedge for selecting wavelengths of light from the source;

C. a reference means and a measuring means for sensing the selected wavelengths;

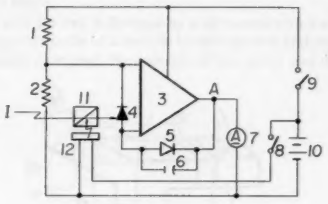
D. bifurcated fiber optics comprising a bundle of light conductive threads, one end of the bundle being of rectangular cross section and disposed adjacent the wedge, the opposite end of the bundle being divided into two branches, each branch containing approximately one half of the number of threads in the end of rectangular cross section, one branch being so positioned to transmit light through a sample to be analyzed to the measuring means and the other branch being so positioned to transmit light to the reference means; and

E. means for comparing the output of the sensing means.

3,885,880
LIGHT SENSING DEVICE WITH AUXILIARY ILLUMINATION

Tokuichi Tsunekawa, Yokohama; Soichi Nakamoto, Tokyo; Tetsuya Taguchi, Kawasaki, and Takehiko Kiyohara, Zama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Nov. 7, 1973, Ser. No. 413,494
Claims priority, application Japan, Nov. 9, 1972, 47-112284
Int. Cl. G01j *1/16*
U.S. Cl. 356—226 **8 Claims**

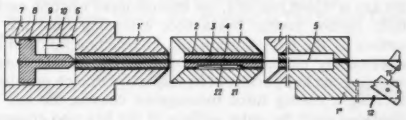


1. A light sensing device comprising, in combination, a photovoltaic cell generating an electric signal proportional to the light intensity incident thereupon, and having an output; a direct current operational amplifier having an input connected to the output of said cell and having an output; a source of d.c. potential; switch means selectively operable to connect said source to said amplifier to provide an operating potential thereto to initiate a light sensing operation; indicating means connected to the output of said amplifier to indicate a light value responsive to the amplified electric output signal of said cell; irradiating means operable, when energized, to emit light incident upon said cell; and means operable, upon initiation of a light sensing operation, to connect said irradiating means to said source for at least momentarily energizing said irradiating means.

3,885,881
ELONGATED, COLLAPSIBLE DEVICE

Bernhard Goldmann, Viktorgasse, Vienna, Austria (A-1040)

Filed Dec. 20, 1973, Ser. No. 426,853
Claims priority, application Austria, Dec. 22, 1972, 11032/72
Int. Cl. F16b *7/10*
U.S. Cl. 403—291 **14 Claims**

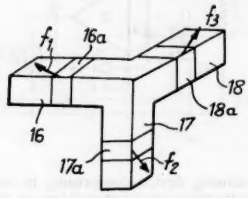


1. An elongated device collapsible into a plurality of shorter sections comprising a plurality of component elements, each of which is longitudinally permeated by at least one flexible tension member for clamping together said component elements strung on the tension member in end-to-end contact, at least one core within each of said component elements, said cores being longitudinally shiftable relative to said component elements, each core having longitudinally spaced front faces, the cores disposed in adjacent component elements contacting one another with their front faces, and a means connected to the tension member for shifting the cores into a position in which the front faces of the cores are axially offset relative to the ends of the component elements.

3,885,882
COUPLING FOR THE ASSEMBLY OF CLOSELY JOINTED TUBULAR ELEMENTS

Lucien Curti, Le Clos Fleuri-rue Pierre Vaudnay, 78350 Jouy en Josas, France

Filed May 15, 1973, Ser. No. 360,451
Claims priority, application France, May 17, 1972, 72.17672
Int. Cl. F16b 7/18
U.S. Cl. 403—297 4 Claims

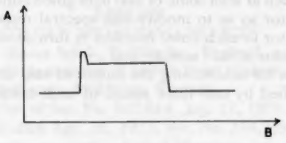


1. In a coupling for the assembly of closely jointed tubular elements having as many branch members as there are tubular elements to be assembled, said coupling including a branch member, said branch member including a body portion and a key portion with the body portion having a cross-sectional configuration adapted to conform to that of its respective tubular element and includes a maximum dimension being of such a magnitude that the branch member is adapted to be situated within its respective tubular element with a certain play and adapted to be wedged therein by the displacement of its key portion, each said body portion further having a lateral slot which extends into the body portion defining thereby three surfaces, the key being received within said slot and having an outer surface conforming to the inner surface of its respective tubular element and three further surfaces which confront and are coextensive with said three surfaces when the key is within said slot, the improvement wherein each said body portion further has a bore extending from the outer surface of the body portion and intersecting said slot and a displaceably mounted pointed-end screw in said bore and engaging the key portion of its respective branch member and exerting a biasing force thereagainst causing the key to be displaced until the outer surface of the key also engages the inner surface of the respective tubular element, the displacement being in a direction which is perpendicular to the longitudinal axis of the respective body portion and inclined with respect to each of the planes of the angles defined respectively by the plane containing the longitudinal axis of the respective body portion on the one hand and the planes containing the axes of the body portion of the other branch members on the other hand, obtaining an outward displacement directed toward the exterior of each of the angles causing in that direction, as a result of the engagement of said key with its respective tubular element, a slight lateral displacement of the respective tubular element, and adapted to close the visible junction line of the tubular elements with their adjacent tubular elements.

3,885,883
METHOD AND APPARATUS FOR COMPACTING EARTH, SAND, GRAVEL, BALLAST AND SIMILAR MATERIALS

Helmut Sieke, An der Trift 5, 3001 Wulferode, and Rainer Sieke, Am Pahlberg 18, 3161 Ehlershausen, both of Germany

Filed Mar. 21, 1973, Ser. No. 343,482
Claims priority, application Germany, Mar. 21, 1972, 2213577
Int. Cl. E01c 3/06
U.S. Cl. 404—72 9 Claims

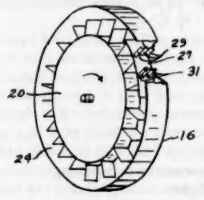


1. A process for compacting earth, sand, gravel, ballast and similar material which comprises subjecting a selected small area of sand material at a time to a periodic succession of individual pressure thrusts by means of a rectilinearly reciprocating compacting tool which is reciprocated cyclically but non-sinusoidally, the compacting tool at the beginning of each cycle being given a strong push through which a strong compacting pressure thrust is exerted on said material and pressure being thereafter maintained on said material by said tool for a selected period of time not less than one quarter of a cycle to hold the compacted material in place and thereby allow time for it to become settled and fixed in compacted condition, whereupon the pressure of said compacting tool on said material is relieved to complete the cycle, and thereupon repeating the cycle.

3,885,884
APPARATUS FOR PROVIDING AN AERODYNAMIC WINDOW

David B. Wilkinson, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 9, 1974, Ser. No. 468,329
Int. Cl. F04f 1/00, 5/20
U.S. Cl. 415—53 5 Claims



1. An apparatus for maintaining a pressure difference across an opening between a high pressure region and a low pressure region, comprising: a housing having two spaced flat walls and a circular wall interconnecting said flat walls; a first aperture in one of said flat walls adjacent said circular wall; a second aperture in the other flat wall in alignment with said first aperture; means for connecting one of said pressure regions to said first aperture; means for providing a flow of gas along a path within said housing, adjacent said circular wall and past said apertures; means, in the gas flow path on one side of said apertures for directing the gas flow toward the aperture adjacent the high pressure region; and means, in the gas flow path on the other side of said apertures, for redirecting the gas flow

into the gas flow path adjacent the circular wall within said housing.

3,885,885

FLUID PROPELLING APPARATUS EMPLOYING FLEXIBLE DRIVE SHAFT

Fred E. Cross, Jr., Eustis, Fla., assignor to Highway Equipment & Supply Company, Orlando, Fla.

Filed Oct. 1, 1973, Ser. No. 402,147
Int. Cl. F01d *15/12*
U.S. Cl. 415—122 **5 Claims**

1. Apparatus comprising, in combination:
a flexible, hollow hose having two open ends;
a propeller at one end of said hollow member for propelling fluid therethrough;
prime moving means at the other end of said hollow member and spaced therefrom;
an outer, water-tight casing having an outer diameter substantially less than the inner diameter of said hose;
a flexible core positioned within said flexible casing;
a nipple surrounding said propeller and including an opening axial with said propeller;
a spider fixed in said nipple for positioning said flexible core in said flexible casing at said one end of said hose;
another spider positioned at the extremity of said nipple opening and having a threaded opening through said another spider axial with said propeller and the extremity of said flexible core;
a threaded thrust bearing member adjustably positioned in said threaded opening, said thrust bearing member including a thrust aperture facing said propeller; and
a conical thrust bearing fixed at the extremity of said flexible core and extending into said thrust aperture.

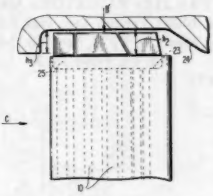
3,885,886

UNSHROUDED INTERNALLY COOLED TURBINE BLADES

Werner Richter, Hilgertshausen, Germany, assignor to Motoren-und Turbinen-Union Munich GmbH, Germany

Filed June 27, 1973, Ser. No. 374,231
Claims priority, application Germany, June 27, 1972, 2231426
Int. Cl. F01d *1/18, 5/18*
U.S. Cl. 415—116 **5 Claims**

1. An unshrouded turbine rotor blade of the type which in use is rotatable about a rotor axis and has radially inner and outer ends with respect to said axis; said blade comprising:
a tip well formed adjacent the radially outer end of the blade,
cooling flow cavity means in said blade which terminate in cooling medium exit means opening into said tip well such that cooling medium flows through said cavity means into said tip well during rotation of said blade,
cooling flow deflecting means for deflecting the flow of cooling medium out of said tip well, said cooling flow cavity means, said cooling medium exit means and said cooling flow deflecting means being relatively configured in such a manner that outflows of said cooling medium from said tip well impart reactive forces against said blade in the direction of blade rotation,
blade rubbing crown means at the radially outer end of the blade for accommodating rubbing engagement of the blade against a turbine casing means which surrounds the blade in use,
and turbine casing means for accommodating the outer end of said blade,
wherein said tip well is formed by wall means which extend radially outwardly of a bottom of said tip well and circumferentially surround the contour of the outer end of said blade,



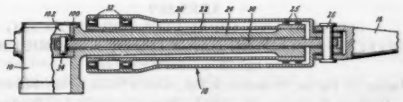
wherein said cooling flow deflecting means includes opening means in said wall means which extend over at least a portion of one side of the blade,
wherein said blade has a suction side which faces in the general direction of rotation of the blade and a pressure side which faces in the general direction opposite the direction of rotation of the blade,
wherein said one side is said pressure side,
wherein said wall means includes suction side wall member means which have the radially outer ends thereof bent toward the pressure side of the blade, said opening means being formed between said radially outer ends of said suction side wall member means and respective radial outer ends of pressure side wall member means forming part of said wall means, and
wherein said turbine casing means for accommodating the outer end of said blade includes an annular slot which has a radial depth which is approximately equal to the radial extent of said opening means formed between said suction side wall members and pressure side wall members.

3,885,887

FLEXURE FOR BEARINGLESS ROTOR

Rene A. Desjardins, Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 5, 1973, Ser. No. 421,891
Int. Cl. B64c *11/12, 27/38*
U.S. Cl. 416—141 **5 Claims**



1. In a rotor for a rotor craft having a rotor hub with a rotor blade mounted thereto, a flexure for mounting the rotor blade to the rotor hub so as to permit flapping, lead lag and pitch, which comprises:
a tubular first stage having one end thereof rigidly connected to the rotor hub extending radially therefrom;

a tubular second stage having one end thereof rigidly connected to the remaining end of said first stage, oriented concentrically about said first stage and extending radially toward the hub;

a tubular third stage having one end thereof mounted to the remaining end of said second stage so that axial movement therebetween may take place, said third stage mounted concentrically about said second stage, the remaining end of said third stage rigidly connected to the rotor blade; and

a tension-torsion strap mounted concentrically within said first stage connected at one end to the rotor hub and connected at the other end to the rotor blade for restraining axial movement and bearing tension loads therebetween.

3,885,888

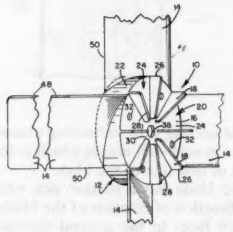
COOLING FAN FOR RADIATORS AND THE LIKE

John G. Warhol, 14041 Vernon Ave., Oak Park, Mich. 48237

Filed Mar. 26, 1973, Ser. No. 344,976

Int. Cl. F04d *29/28*

U.S. Cl. 416—175 **7 Claims**



1. A cooling fan for cooling radiators and the like comprising, a central hub and a plurality of radially extending main blades extending radially outward of said hub, said hub having a flat front face and a plurality of radially extending hub blades extending across the face of the hub and forwardly of said face, said front face and hub blades being integrally formed of plastic material, said hub blades radiating from a common axis, each said hub blade having a generally triangular shape in side elevation with the widest part of the blade adjacent the outer peripheral or top edge of the blade and reducing in width toward the center of the flat front face so that the lead edge of the blade is inclined inwardly from the outer peripheral or top edge toward the center and with the opposite sides of the blade being planar and parallel to each other and of a uniform thickness, with the outer peripheral edge of the blade extending substantially to the outer peripheral edge of the flat front face of the hub and the inner end of the blade being adjacent the axis or center of the flat front face, said hub blades forming a hub turbine and serving to distribute or break up the flow of air hitting the hub portion of the fan and directing said air outwardly into the path of environment of the flow of air created by the main fan blades.

3,885,889

METHOD AND APPARATUS FOR REDUCING EFFECTIVE PUMPING CAPACITY OF A REFRIGERANT VAPOR COMPRESSOR

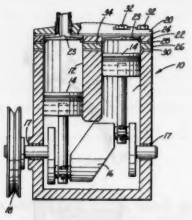
James D. Bares, Woodstock Rd., Gates Mills, Ohio 44040, and William P. Burke, Jr., 7665 Chesterbrook Rd., Chesterland, Ohio 44026

Filed Jan. 2, 1974, Ser. No. 429,918

Int. Cl. F04b *49/00*

U.S. Cl. 417—274 **4 Claims**

1. A method of reducing the effective pumping capacity of a refrigerant vapor compressor, which compressor includes a block having at least one cylinder bore therein with a piston reciprocally mounted in each bore and each having a predetermined fixed stroke length, a cylinder head, and a valve plate interposed between said head and said block, comprising the steps of providing a spacer plate having through bores therein corresponding to the cylinder bores and forming a continuation of each cylinder bore, said spacer plate being formed of a relatively rigid relatively non-deformable material, and interposing the spacer plate between the valve plate and block, whereby to increase the clearance volume of the cylinder bore and decrease the volumetric efficiency.



3. In a refrigerant vapor compressor having a block with at least one cylinder bore therein, and with a piston reciprocally mounted in each bore and each having a predetermined fixed stroke length, said compressor having also a head, and a valve plate interposed between the head and the block, the improvement comprising, a spacer plate formed of a rigid relatively nondeformable material interposed between said valve plate and said block, said spacer plate having a through aperture corresponding to each cylinder bore and each forming a continuation of each cylinder bore, whereby to decrease the effective pumping capacity and volumetric efficiency of the compressor by increasing the clearance volume of the cylinder bore.

3,885,890

ELECTROMAGNETIC PUMPS

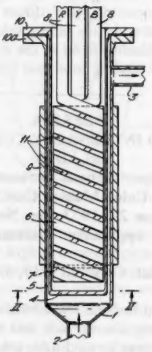
Daniel Fraser Davidson, Altrincham, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 2, 1973, Ser. No. 346,933

Claims priority, application United Kingdom, Apr. 26, 1972, 19490/72

Int. Cl. H02n *4/20*

U.S. Cl. 417—50 **4 Claims**



1. An electromagnetic pump comprising a cylindrical iron core co-axially arranged within an iron casing to bound an annular flow duct for liquid metal, the core being of laminated form and having three equally spaced, external helical slots and three equally spaced helical slits, the slits being in oppo-

site rotational direction to the slots and intersecting the slots at right angles thereto, the slots being lined with electrically insulating material and housing windings adapted for connection at one end to a three phase electricity supply and joined together by a star point connection at the other end, the windings each comprising a stack of helically wound copper laminations and having coatings of insulating material on the outer circumferential surfaces, and a closely fitting stainless steel sheath for the core and windings.

3,885,891

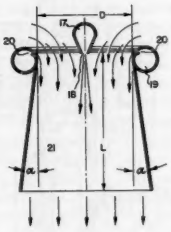
COMPOUND EJECTOR

Lester W. Throndson, Westerville, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 310,723, Nov. 30, 1972, abandoned. This application Jan. 11, 1974, Ser. No. 432,724

Int. Cl. F04f *5/44*

U.S. Cl. 417—196 **15 Claims**



1. In ejector apparatus immersed in a body of secondary flow fluid and producing an augmented thrust vector oriented along an ejector longitudinal axis, in combination:

perimeter injector means having opposed discharge slots that are positioned at opposite sides of said longitudinal axis and that are oriented and sized to each discharge primary fluid flowed therethrough in a direction toward and substantially at right angles to said longitudinal axis at a discharge velocity greater than approximately 0.7 Mach number;

convergent inlet surfaces each extending from immediately adjacent a respective one of said perimeter injector means opposed discharge slots and continuing in the direction of fluid flow along said longitudinal axis through a rotational angle in the range of approximately 80° to 110° to form an ejector apparatus throat having a minimum dimension D in a direction normal to said longitudinal axis;

center injector means having a discharge nozzle that is positioned intermediate said perimeter injector means discharge slots and above said ejector apparatus throat minimum dimension D and that is oriented and sized to discharge primary fluid flowed therethrough in a direction generally along said longitudinal axis at a discharge velocity greater than approximately 0.7 Mach number;

divergent diffuser surfaces continuing from said convergent inlet surfaces in the region of said ejector apparatus throat minimum dimension D to a termination at an interface with said body of secondary flow fluid and with an average divergence with respect to each other of angle 2α; and

duct means flowing high energy primary flow fluid to said perimeter injector means discharge slots and to said center injector means discharge nozzle at pressure ratios greater than approximately 1.3 relative to said body of secondary flow fluid and at flow rates sufficient for maintaining said discharge velocities,

said perimeter injector means opposed discharge slots and said divergent diffuser surfaces termination being separated in a direction along said longitudinal axis by a distance L that is less than approximately 2.5 times said ejector apparatus throat minimum dimension D, and said divergent diffuser surfaces average divergence angle 2α being at least approximately 15°.

3,885,892

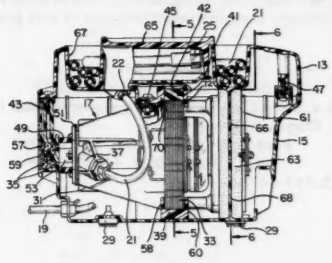
HOUSING ASSEMBLY FOR AIR COMPRESSOR AND THE LIKE

John Robert Dwyer, Timonium; Martin Omer Schrock; John Earl Dibbern, Jr., and Alfred Herbert Judge, all of Baltimore, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed May 29, 1973, Ser. No. 364,812

Int. Cl. F04b *21/00*

U.S. Cl. 417—234 **5 Claims**



2. A housing assembly for a portable, electric, air compressor as claimed in claim 1 wherein said housing comprises separable housing members adapted to entrappingly contain said air compressor therein, said housing members being formed of an electrically insulating material, said housing members forming a container whose top is provided with a substantially annular recess therein, a central handle integral with said top and disposed in said recess and forming carrying means for said compressor, said compressor having air hose means connected thereto and extending through an opening in said housing within said recess, said air hose being adapted to be stored within said recess about said handle.

3,885,893

MULTIPLE CYLINDER PUMP

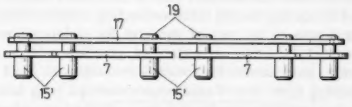
Wilfried Glock, and Ludwig Axthammer, both of Hambach, Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed Apr. 17, 1974, Ser. No. 461,713

Claims priority, application Germany, Apr. 17, 1973, 2319307

Int. Cl. F04b *1/04;* **F16k** *15/00*

U.S. Cl. 417—273 **10 Claims**



1. In a pump including wall means defining an intake cavity, a shaft having an axis and mounted for rotation about said axis, a plurality of cylinders communicating with said cavity and extending from the same in angularly spaced relationship relative to said axis, a piston movable in each cylinder, an outlet conduit communicating with each cylinder, actuating means on said shaft for sequentially moving said pistons in the respective cylinders during rotation of said shaft and for thereby pumping fluid from said cavity to said conduits, an annular manifold communicating with said conduits and circumferentially extending about said axis, a plurality of check

valve means respectively associated with each conduit for permitting fluid flow from the associated conduit toward said manifold while impeding fluid flow from said manifold into the associated conduit, and a discharge conduit leading outward of said manifold, the improvement in each of said valve means which comprises:

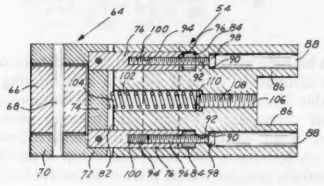
a. an elongated valve plate in said manifold,
   1. said outlet conduits having circumferentially spaced respective orifices in said manifold; and
b. guide means in said manifold guiding said valve plate transversely to the direction of elongation thereof toward and away from a position of sealing engagement with the orifice of the associated conduit,
   1. said guide means including a plurality of guide pins circumferentially spaced in said manifold,
   2. two longitudinally spaced portions of each valve plate slidably engaging respective ones of said guide pins.

3,885,894

ROLLER-TYPE BLOOD PUMP

Ernest A. Sikes, Cheyenne, Wyo., assignor to Sikes Industries, Inc., Cheyenne, Wyo.

Filed Apr. 13, 1973, Ser. No. 350,992
Int. Cl. F04b *43/08, 43/12, 45/06*
U.S. Cl. 417—477 **3 Claims**



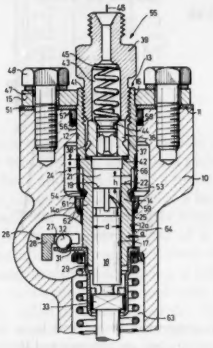
1. In a roller pump of the type having a base, an upstanding wall atop the base defining a concave semi-cylindrical raceway, latch means located at opposite ends of said raceway adapted to releasably hold an arcuate section of flexible tubing in position against said raceway, a shaft journalled for rotation within the base about an axis coincident with the cylindrical surface of said raceway, and an impeller assembly movable by said shaft for causing fluid movement through the tubing by collapsibly distorting said tubing, the improvement which comprises: providing said impeller assembly with an elongate arm mounted on the shaft for conjoint rotation about an axis intermediate the ends of said arm; a pair of roller frames each having one end adapted for attachment to an end of the arm and another end notched to accept a roller for rotation within said notch; a cylindrical roller mounted for rotation within the notched end of each roller frame; telescopable connecting means interconnecting said one end of each roller frame to an end of the arm for independent relative movement between an extended position and a retracted position, said connecting means including at least one rod projecting from one of said interconnected ends and a corresponding opening positioned and adapted to telescopically receive said rod in the other of said interconnected ends; biasing means interposed between said interconnected ends of said arm and roller frame independently biasing said roller frame into extended position; and, adjustable stop means operative upon actuation to independently limit the maximum extension of each roller frame relative to the end of said arm to which said roller frame is connected, said stop means including an enlarged head carried by a portion of said rod telescoped within the opening receiving said rod and a section of said opening cooperating to define a shoulder positioned to engage said enlarged head upon movement of said roller frame toward extended position, said head being mounted for adjustment in the direction of the length of said rod to vary the distance separating said head from the interconnected end from which said rod projects.

3,885,895

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Heinrich Staudt, Markgroningen-Talhausen; Eberhard Hofmann, Kirchberg; Wolfgang Eckell, Gebersheim, and Peter Knorreck, Munchingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation of Ser. No. 289,642, Sept. 18, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,448
Claims priority, application Germany, Sept. 18, 1971, 2146797; Oct. 13, 1971, 2150973
Int. Cl. F04b *7/04, 37/10*
U.S. Cl. 417—499 **8 Claims**



1. In a fuel injection pump for an internal combustion engine, said pump being of the known type that includes

A. a one piece pump housing having
   1. an external edge face,
   2. a mounting bore extending into said housing from said edge face and defining a wall,
   3. a suction chamber,
B. a flanged sleeve formed of
   1. a cylinder sleeve having
      a. a cylinder bore, said cylinder bore defining a wall,
      b. an enlarged chamber adjoining said cylinder bore, said chamber defining a wall,
      c. an inner annular shoulder separating said cylinder bore from said enlarged chamber,
      d. an internal thread provided in the wall of said enlarged chamber and defining a zone of said wall of said enlarged chamber,
      e. a throughgoing control port provided in the wall of said cylinder sleeve in a zone defined by said cylinder bore, said control port connecting said cylinder bore with said suction chamber and
   2. a securing flange fixedly attached to said cylinder sleeve and extending radially outwardly therefrom,
C. bolts for clamping said securing flange to said edge face,
D. a pump piston axially slidably and angularly adjustably disposed in said cylinder bore, said pump piston having on its lateral face an obliquely extending control edge cooperating with said control port during reciprocating motion of said pump piston,
E. means for adjusting the angular position of said pump piston for varying the position of said control edge with respect to said control port for altering the length of the effective pressure stroke of said pump piston during which fuel delivery takes place,
F. a pressure valve disposed in said enlarged chamber of said cylinder sleeve, said pressure valve having a stationary valve body, and

G. an externally threaded nipple engaging the internal thread of said enlarged chamber and clamping said valve body against said shoulder; said flanged sleeve, said pump piston, said pressure valve and said threaded nipple forming a preassembled group of pump elements, the improvement comprising:

i. a guide collar forming part of said cylinder sleeve and situated between said securing flange and said control port, said guide collar constituting the sole part of said preassembled group of pump elements that engages said mounting bore, the cylinder sleeve, apart from said guide collar, being disposed in said mounting bore with an annular clearance from the mounting bore wall;

ii. a longitudinally displaceable fuel rack; and

iii. an actuator arm secured to said pump piston and operatively connected to said fuel rack, said actuator arm and said fuel rack forming part of said means for adjusting the angular position of said pump piston, and wherein said cylinder sleeve is formed as a one piece member and said securing flange is exclusively positioned in the zone defined by said internal thread and axially spaced from said valve body, wherein said cylinder sleeve has an external surface portion in the zone between said shoulder and said control port, the axial distance between the beginning of said external surface portion and said shoulder being at least 0.25 times the inner diameter of said enlarged chamber, said cylinder sleeve having a portion of reduced outer diameter extending from said external surface portion away from said enlarged chamber, said reduced outer diameter being approximately 1.5 times the inner diameter of the largest permissible cylinder bore, said cylinder sleeve having its maximum hardness in the zone of said cylinder bore, the hardness of said cylinder sleeve decreasing radially towards said external surface portion and axially towards said internal thread.

3,885,896

LIQUID COOLED HOUSING FOR ROTARY PISTON COMBUSTION ENGINE

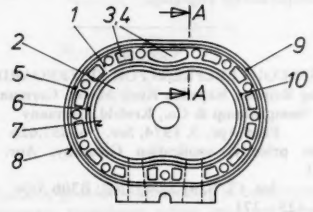
Max Ruf, Obereisesheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Germany

Filed June 12, 1974, Ser. No. 478,781

Claims priority, application Germany, June 16, 1973, 7322559

Int. Cl. F01c *21/06, 19/12*

U.S. Cl. 418—83 **3 Claims**



1. A liquid-cooled housing for a rotary piston combustion engine, comprised of at least one annular shell and two parallel end pieces, the shell and end pieces containing chambers traversed by cooling liquid and communicating with each other, ports in the meeting faces of the shell and end pieces communicating with the chambers, grooves encircling the ports close to the inner surface of the shell and essentially parallel thereto near the outer periphery of the shell, gaskets, the ports being sealed by the gaskets recessed in the encircling grooves, at least one side wall of each groove having a plurality of projections to retain the gasket during assembly.

3,885,897

LUBRICATING DEVICE FOR RADIAL SEALING STRIPS OF INNER-AXIAL ROTARY PISTON ENGINES OF TROCHOIDAL CONSTRUCTION WITH SLIDING ENGAGEMENT

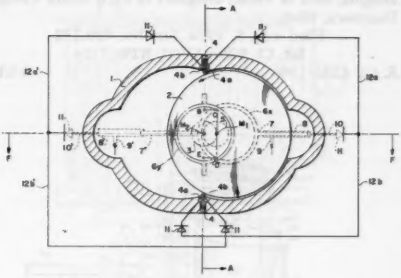
Franz Huf, Constance, Germany, assignor to Dornier System GmbH, Friedrichshafen, Germany

Filed July 16, 1973, Ser. No. 379,601

Claims priority, application Germany, Aug. 16, 1972, 2240100

Int. Cl. F04c *29/02*

U.S. Cl. 418—88 **10 Claims**



1. In a rotary piston engine having a piston means of epitrochoidal configuration, a housing having an internal configuration conforming substantially to the outer envelope curve of the trochoid, eccentric shaft means operatively connected to said piston, radial sealing strip means mounted in a corresponding bed in the interior side walls of said housing and lubricant groove means formed in the walls of said bed, the improvement comprising, drive means operatively connected to said piston to convert linear sliding movement of said drive means to rotary motion of said piston, pump means operatively coupled to at least one sliding element of said drive means, lubricant line means operatively connecting said pump means to said lubricant groove and non-return valve means operatively mounted in said lubricant line.

3,885,898

ROTARY PISTON INTERNAL COMBUSTION ENGINE WITH UNITARY OR MULTI-PARTITE SEALING BAR

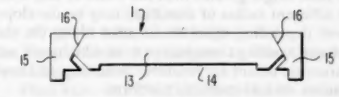
Heinz Lamm, Esslingen-St. Bernhardt, and Lothar Kortner, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 6, 1972, Ser. No. 232,000

Claims priority, application Germany, Mar. 6, 1971, 2110817

Int. Cl. F01c *19/02, 21/00;* **F04c** *27/00*

U.S. Cl. 418—122 **7 Claims**



1. A rotary piston internal combustion engine with a housing including lateral parts and a casing and with a piston having a piston axis which piston is provided with several piston grooves extending substantially parallel to the axis over substantially the entire piston width, into which grooves radial sealing bar means are radially movably inserted, characterized in that at least one of said sealing bar means is multi-partite and consists of a center part and two corner parts, at least one of said corner parts includes plural adjacent surfaces extending at an angle to one another to define upper and lower corner part separating planes, said central part has at least one

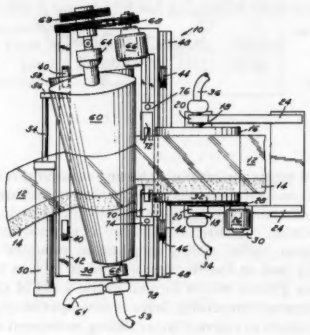
end which includes plural adjacent surfaces extending at an angle to one another to define upper and lower central part separating planes, each of said corner part separating planes faces a corresponding central part separating plane, and said central part abuts said at least one corner part only at the respective upper separating planes.

3,885,899

APPARATUS FOR EXPANDING A LAMINATING INTERLAYER

Daniel J. Gurta, Westland, and George A. Koss, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 5, 1974, Ser. No. 489,272
Int. Cl. B29c *17/00*; B29d *7/24*
U.S. Cl. 425—150 **6 Claims**



1. An apparatus for expanding a laminating interlayer which comprises:

feeding means for feeding a continuous web of laminating interlayer material from a supply thereof;

heating means associated with said feeding means for heating said web to a temperature whereat it is pliable, said heating means and said feeding means being stationary;

a movable platform adjacent to said last two mentioned means;

controllable means for moving said movable platform in a direction perpendicular to the path of travel of said web being fed from said feeding means;

cooling cone means both for applying a stretching force to and for cooling said web, said cooling cone means having a slant height greater than the width of said web whereby a different radius of curvature may be developed in said web depending upon the location along the slant height of said cooling cone means over which said web passes; structure means for rotatably mounting said cooling cone means on said movable platform;

edge position sensing means secured to said platform for sensing the location of one edge of said web at a position located between said feeding means and said cooling cone means, said edge position sensing means developing a signal indicative of the location of said edge with respect thereto; and

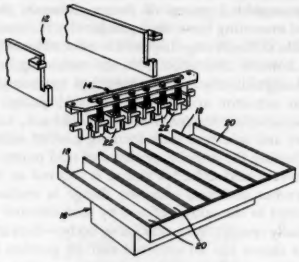
means responsive to the signal of said edge position sensing means for operating said controllable means to adjust said movable platform to keep said edge of said web located in a particular position with respect to said edge position sensing means and thereby with a particular location along the slant height of said cooling cone means.

3,885,900

FEED BOX CUT-OFF GATE

George E. Kanta, Box 96, Three Forks, Mont. 59752

Filed Sept. 21, 1973, Ser. No. 399,614
Int. Cl. B29c *3/04*
U.S. Cl. 425—219 **13 Claims**



1. A cut-off gate for a feed box of a molding machine, comprising, in combination:

a. a plurality of cut-off shoes, each shoe associated with a respective compartment of an associated mold box; and

b. means for adjustably mounting the cut-off shoes on the cut-off gate and permitting each shoe to be adjusted independently of each other shoe whereby a height of an article molded in each mold box compartment is variable, the means for adjustably mounting including:

i. a bar mountable on a feed box;

ii. a plurality of adjusting members mounted on and spaced along the bar, each adjusting member associated with a respective one of the cut-off shoes;

iii. means connected to the cut-off shoes for cooperatively engaging with the adjusting members, mounting the shoes on the bar side-by-side in a common plane, and permitting the adjustment of the cut-off shoes independently from one another; and

iv. means for biasing the bar and cut-off shoes away from one another, the means for biasing including a plurality of compression springs, each spring arranged adjacent a respective adjusting member and with end portions of the spring abutting both the bar and the means for cooperatively engaging.

3,885,901

CONTINUOUS PREPRESS FOR FIBERBOARD PLANT

Wolfgang Reiners, Kapellen Kreis Moers, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany

Filed Apr. 3, 1974, Ser. No. 457,626
Claims priority, application Germany, Apr. 4, 1973, 2316781
Int. Cl. B29j *5/04*, *5/08*; B30b *5/04*
U.S. Cl. 425—371 **6 Claims**

1. A roller frame for a continuous band press, said frame comprising:

a pair of longitudinally extending generally horizontal beams;

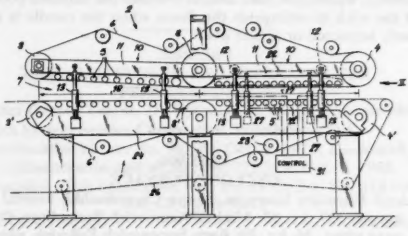
a pair of transversely extending generally horizontal beams bridging said longitudinal beams;

means rigidly fixing one end of each transverse beam to a respective one of said longitudinal beams;

a ball joint between the other end of each transverse beam and the other respective longitudinal beam;

a pair of generally parallel horizontally spaced rollers received between said longitudinal beams generally at the ends thereof;

a self-aligning bearing rotatably holding each end of each roller on the respective longitudinal beam; and



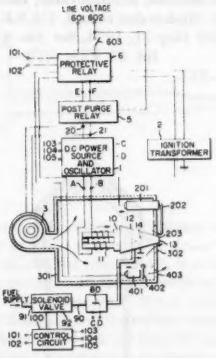
means for limited transverse displacement between each roller and a respective longitudinal beam.

3,885,902

ULTRASONIC GENERATOR AND BURNER

Hiroshi Fujieda, Yamatokoriyama, and Taro Yamamoto, Uji, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 23, 1973, Ser. No. 381,786
Claims priority, application Japan, July 31, 1972, 47-77218
Int. Cl. F23c *3/02, 11/00*
U.S. Cl. 431—1 **22 Claims**



1. An ultrasonic generator comprising in combination

a. an ultrasonic transducer whose motional admittance becomes maximum at a resonant frequency,

b. an oscillator comprising an amplifier driving said ultrasonic transducer with a square waveform voltage at a frequency substantially equal to said resonant frequency, whereby a surface of the transducer oscillates and a feedback circuit for feeding back to said amplifier an AC control voltage in proportion to the driving current which drives said ultrasonic transducer,

c. a DC power source for supplying DC power to said oscillator, said DC power source being provided with a DC voltage regulator and

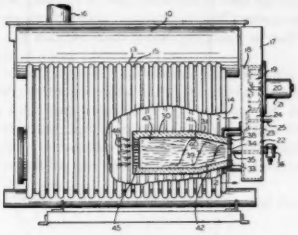
d. means for converting said AC control voltage into a DC control input voltage for said regulator.

3,885,903

REDUCTION OF POLLUTANTS IN GASEOUS HYDROCARBON COMBUSTION PRODUCTS

Paul G. La Haye, Cape Elizabeth, Maine, assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Oct. 30, 1972, Ser. No. 302,133
Int. Cl. F23c *11/00, 9/02*
U.S. Cl. 431—8 **19 Claims**



1. A method of burning fuel in a manner to reduce the nitrogen oxides, carbon monoxide, and unburned hydrocarbons and carbonaceous particulates in the exhaust gases therefrom, comprising:

a. developing in a continuous combustion zone an ignited core stream constituting a fuel-rich mixture of fuel and substantially less than the amount of air required for stoichiometric combustion,

b. introducing into said continuous combustion zone a sheath of air which surrounds and interfaces directly with said core stream and which flows therealong without discontinuity, the quantity of air introduced as said sheath being at least the entire quantity of additional air and not substantially more than the additional air required to make up the stoichiometric amount for complete combustion of said fuel,

c. passing said sheath in a heat exchange relation with cooling means for extracting some heat permanently from said core stream, and then

d. allowing the incompletely oxidized gaseous combustion products and said sheath air to mix in non-discrete stages in said combustion zone and effect further combustion of some of the theretofore incompletely oxidized components of said fuel at a low enough temperature to avoid production of substantial quantities of nitrogen oxides.

3,885,904

SYSTEM FOR VAPORIZING OIL

Chung Liao Feng, Radnor, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Mar. 1, 1974, Ser. No. 447,161
Int. Cl. F23d *11/44*
U.S. Cl. 431—11 **4 Claims**

1. The method of preparing a liquid hydrocarbon for combustion which comprises:

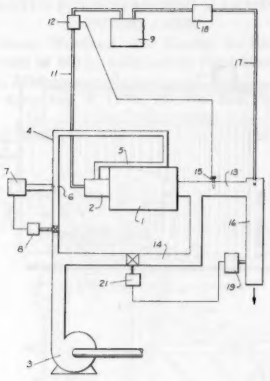
burning fuel and air to produce hot products of combustion,

mixing a supply of additional air with said products of combustion,

regulating the supply of fuel to maintain the mixture of additional air and products of combustion at a temperature above the temperature of vaporization of said liquid hydrocarbon,

injecting liquid hydrocarbon into said hot mixture thereby

to vaporize the hydrocarbon and form a vapor-air mixture, and



adjusting said supply of additional air to obtain a ratio of air to vapor so that the vapor-air mixture is combustible.

3,885,905

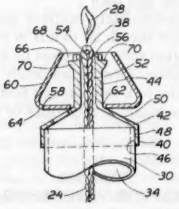
CANDLE WITH AUTOMATIC SNUFFER

Clayton Giangiulio, 5 Skyline Dr., Malvern, Pa. 19355

Filed Dec. 14, 1973, Ser. No. 424,992

Int. Cl. F23q *25/00*

U.S. Cl. 431—34 **9 Claims**



1. A candle arranged to flame when in a stable upright orientation and to automatically extinguish its flame when suddenly impacted or knocked over out of its upright orientation, comprising tubular a body for containing a combustible fuel and terminating in a first end having a cap with a tapered surface, a wick extending into said cap, with a predetermined length portion of the wick extending out of the apex of said tapered surface, said extending wick portion being exposed and serving as the site of the flame and automatic snuffer means comprising a hollow member having a base wall and an inwardly extending side wall projecting therefrom, said base wall having a central opening therein into which a portion of said tapered surface extends, said snuffer being loosely coupled to said first end, while being freely rotatable about the axis of said extending wick portion and pivotable with respect thereto, whereupon said snuffer overlies the exposed portion of the wick to extinguish the flame when the candle is suddenly impacted or tipped over.

3,885,906

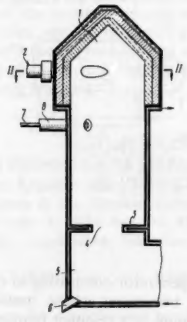
CYCLONE FURNACE

Alexei Petrovich Shurygin, Novye Cheremushki, kvartal 24, korpus 227, kv. 35; Mikhail Naumovich Bernadiner, Ozernaya ulitsa, 36, kv. 20; Boris Semenovich Esilevich, ulitsa 9 Rota, 14, kv. 10; Georgy Nesanelovich Rubinshtein, ulitsa Shukhova, 17, kv. 10; Emanuil Ivanovich Shipov, M. Afanasievsky pereulok, 6, kv. 4; Viktor Georgievich Gubarev, ulitsa Novaya Bodraya, 5, kv. 341; Igor Alexandrovich Lepakhin, ulitsa Bakinskikh Komissarov, 3, korpus 1, kv. 43; Rudolf Rudolfovich Tripushkin, Korennaya ulitsa, 8, kv. 53, all of Moscow; Petr Mikhailovich Sharov, Schekinsky raion, poselok Pervomaisky, ulitsa Komsomolskaya, 33, kv. 22, Tulskaya oblast; Boris Isaevich Lurie, Schekinsky raion, poselok Pervomaisky, ulitsa Komsomolskaya, 33, kv. 22, Tulskaya oblast; Arkady Dmitrievich Vodnev, Schekinsky raion, poselok Pervomaisky, ulitsa Oktyabrskaya, 16a, kv. 10, Tulskaya oblast; Alexandr Bentsionovich Moshkovich, ulitsa Yasnaya, 6, kv. 49, Schekino Tulskoi oblasti; Pavel Alexandrovich Lupanov, ulitsa Sovetskaya, 32, kv. 154, Vidnoe Moskovskoi oblasti, all of U.S.S.R.; Viktor Leonidovich Lukoshkin, deceased, late of ulitsa Novaya, 6, Solnechnogorsk Moskovskoi oblasti, U.S.S.R., and by Tatyana Dmitrievane Lukoshkina, administrator, ulitsa Novaya, 6, Solnechnogorsk Moskovskoi oblasti, U.S.S.R.

Filed May 21, 1974, Ser. No. 471,919

Int. Cl. F23c *5/18*

U.S. Cl. 431—173 **5 Claims**



1. A cyclone furnace for incinerating fluid industrial waste material containing organic or both organic and mineral components, comprising: a vertical cylindrical chamber; burner means arranged in the upper portion of said chamber tangentially to its walls for supplying fuel and air to said chamber; fluid waste atomizers arranged transversely of said chamber under said burner means; nozzles for supplying air, combined

with said atomizers; a bottom of said chamber with an orifice provided therein; a gas duct for removing combustion products, communicating with said chamber through said orifice; a tap for letting out fused mineral components, provided in the lower portion of said gas duct.

3,885,907

INFRARED BURNER AND APPARATUS FOR PRODUCING SAME

Walter Dorwin Teague, Jr., Nyack, N.Y., assignor to Columbia Gas System Service Corporation, Wilmington, Del.

Continuation of Ser. No. 78,549, Oct. 6, 1970, abandoned, Continuation-in-part of Ser. No. 775,978, Oct. 2, 1968, abandoned. This application Dec. 26, 1972, Ser. No. 318,043

Int. Cl. F23d *13/12*

U.S. Cl. 431—328 **6 Claims**

1. In a burner construction for an air-gas mixture, an orifice plate formed of a ceramic material having approximately 60 orifices per square inch of surface area formed therein defining parallel flow paths for the air-gas mixture between the upstream side of the plate and the flame front side of the plate, each of said orifices having parallely extending side walls defining a throat portion having the minimum cross-sectional area of the orifice and having a maximum dimension of the order of 0.046 inches and extending from the upstream side of the plate towards the center of the plate, each orifice also having a diverging portion extending from said throat portion towards said flame front side in the direction of flow of said air-gas mixture, said diverging portion defining an included angle of the order of 13° and having a smooth surface throughout its entire extent, said diverging portion also having a length of the order of 0.033 inches and a cross-sectional area at the flame front side of the plate which is at least twice the area of said throat portion and having a maximum dimension of the order of 0.118 inches, said throat portion having a minimum cross-sectional area of the orifice along substantially its entire length whereby the rate of flow of said air-gas mixture is maximum in said throat and is decreased in said diverging portion of said orifices, said maximum flow rate being greater than the rate of advance of flame in the air-gas mixture.

3,885,908

CLOSED ELECTRIC FURNACE AND METHOD FOR OPERATION THEREOF

Yoshishige Nagoya; Takashi Takeuchi; Kosuke Murai, and Hirota Amano, all of Hachinoheshi, Japan, assignors to Pacific Metals Co., Ltd., Tokyoto, Japan

Filed Jan. 15, 1974, Ser. No. 433,494

Claims priority, application Japan, Mar. 2, 1973, 48-24392

Int. Cl. F27b *3/20*

U.S. Cl. 432—1 **6 Claims**

1. A method for operating a closed electric furnace for the smelting of ferro-nickel, ferro-alloys, pig iron, titanium slag and the like, said process comprising the steps of:

providing an electric furnace having a cover thereon, said cover having therein a plurality of air inlet holes;

supplying into said furnace a charge of material to be smelted, while forming and maintaining a combustion space between said charge and said cover;

operating said electric furnace to smelt said charge and to thereby form in said combustion space carbon monoxide containing by-product gases;

sucking combustion air through said air inlet holes into said combustion space and completely burning herein the carbon monoxide from said by-product gases to form combustion gas;

heating new charges of said material in said furnace by the heat from the burning reaction of said carbon monoxide and by the radiant heat from operation of said electric furnace;

forcedly exhausting said combustion gas from said combustion space by means of an exhaust fan of a dust collector; passing said thus exhausted combustion gas through a heat exchanger and therein effecting heat exchange between said combustion gas and a cold blast, thus cooling said combustion gas and heating said cold blast to form a hot blast;

passing said thus cooled combustion gas to said dust collector and therein removing dust from said cooled combustion gas;

releasing said thus purified combustion gas to the atmosphere; and

using said hot blast in a separate processing operation.

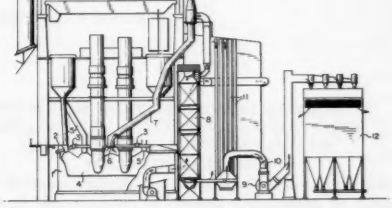
4. A smelting apparatus comprising:

a closed electric furnace having a cover thereon, said cover having therein a plurality of air inlet holes, means for introducing into said furnace a charge of material to be smelted, and an exhaust outlet, there being a combustion space between said charge and said cover;

means for operating said electric furnace to smelt said charge and to form carbon monoxide containing by-product gases;

fan means connected to said exhaust outlet for reducing the pressure in said combustion space and for thus sucking air through said air inlet openings into said combustion space and completely burning therein the carbon monoxide from said by-product gases to form combustion gas, said combustion gas being withdrawn from said combustion space through said exhaust outlet by said fan means;

heat exchanger means positioned between said exhaust outlet and said fan means for cooling said combustion gas, said heat exchanger means including means for passing a cold blast by said combustion gas in heat exchange



relation therewith, thereby cooling said combustion gas and heating said cold blast to form a hot blast; and

dust collector means positioned downstream of said fan means for receipt of said cooled combustion gas and for removing dust therefrom.

3,885,909

COMPRESSION MOLDING APPARATUS

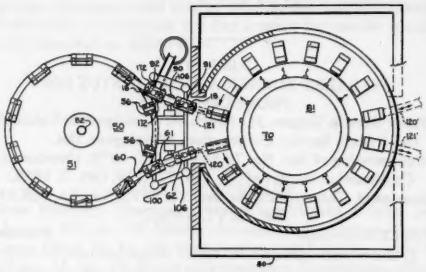
Bruce C. Rockwell, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Division of Ser. No. 388,012, Aug. 13, 1973, Pat. No. 3,844,701. This application Aug. 1, 1974, Ser. No. 494,261

Int. Cl. F27b 9/14

U.S. Cl. 432—122 **5 Claims**

1. An apparatus for compression molding articles positioned within mold carriers comprising, a first table having spaced means on its periphery to receive a plurality of mold carriers, a curing oven, a second table within said oven having spaced means on its periphery to receive a plurality of mold carriers and translating means for alternatively translating the mold carriers from said first table to said second table and from said second table to said first table, said translating means comprising a pair of arcuate members, each arcuate member having a first end radially aligned with the periphery



of said second table and a second end tangentially aligned with the periphery of said first table.

3,885,910
PROCESS FOR FINISHING FIBROUS MATERIALS WITH CHLORITES AND POLYMERIZABLE COMPOUNDS

Klaus Fischer, Kelkheim, Taunus, and Otto Deschler, Niederhofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

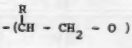
Filed Dec. 29, 1972, Ser. No. 319,463

Claims priority, application Germany, Jan. 3, 1972, 2200112

Int. Cl. D06l *30/6*

U.S. Cl. 8—108 **11 Claims**

1. A process for bleaching and finishing fibrous materials with salts of chlorous acid and polymerizable monomers, which comprises applying to the fibrous materials a composition consisting essentially of a salt of chlorous acid as polymerization initiator and bleaching agent, a polymerizable olefinically unsaturated compound, 0.5 up to 80 percent by weight of water and at least 15 percent by weight of a polyoxyalkylene condensate of an organic compound having 1 to 10 active hydrogen atoms which condensate contains at least one alkylene oxy radical of the formula



wherein R is hydrogen or the methyl or ethyl group, which radical is linked through an oxygen or nitrogen atom to the organic compound having the active hydrogens.

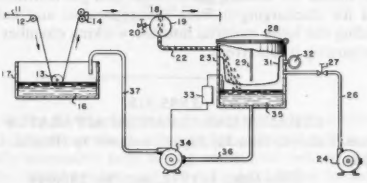
3,885,911
TEXTILE MATERIAL WITH SOIL RELEASE

Emile E. Habib, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 756,072, Aug. 28, 1968, abandoned. This application Oct. 14, 1968, Ser. No. 767,382

Int. Cl. D06

U.S. Cl. 8—115.6 **12 Claims**



1. A process for producing improved knitted or woven textile material comprising linear polyester fibers which comprises applying thereto between about 30 and 100 percent by weight of an aqueous acrylic copolymer soil release composition containing about 2 to 40 percent copolymer, and passing air through said textile material at a rate between about 50 and 100 feet per second sufficient to remove between about 40 and 60 percent soil release composition from the interstices while inhibiting the formation of substantially any excessive film of said composition on the surface of said textile.

3,885,912
METHOD OF RENDERING TEXTILES FLAME RETARDANT WITH PHOSPHORUS CONTAINING MELAMINE

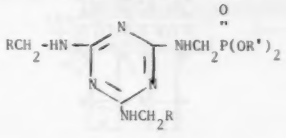
Peter Golborn, Lewiston, and James J. Duffy, Buffalo, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Division of Ser. No. 239,797, March 30, 1972, abandoned. This application Sept. 28, 1973, Ser. No. 401,767

Int. Cl. D06m *1/00*

U.S. Cl. 8—116 P **16 Claims**

1. A process for rendering textiles flame retardant which comprises applying to said textile, in an amount of from about 5 to about 40 percent by weight, a compound of the formula



wherein R is independently selected from the group consisting of —OH and

and wherein R′ is lower alkyl.

3,885,913
METHOD OF INHIBITING THE CORROSION OF METALS IN AN ACIDIC ENVIRONMENT USING QUATERNARY AMMONIUM SALTS OF POLYEPIHALOHYDRIN

Derek Redmore, Ballwin, and Frederick T. Welge, Brentwood, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 26, 1972, Ser. No. 301,176

Int. Cl. C23f *11/04, 11/14*; C23g *1/06*

U.S. Cl. 21—2.7 R **7 Claims**

1. The process of inhibiting corrosion of ferrous metals in an acid system which comprises adding to the acid system a small but effective inhibiting amount of a quaternary compound formed by the reaction of a polyepihalohydrin and a tertiary amine where the tertiary amine is a heterocyclic aromatic compound containing a tertiary nitrogen as part of the ring and is a member selected from the group consisting of pyridine, quinoline, isoquinoline, alkyl derivatives thereof, and mixtures thereof.

3,885,914
POLYMER-ZINC CORROSION INHIBITING METHOD

William Robert Hollingshad, Bethel Park, and Paul Hotchkiss Ralston, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed June 4, 1973, Ser. No. 367,083

Int. Cl. C23f *7/10*

U.S. Cl. 21—2.7 R **4 Claims**

1. A method of inhibiting the corrosion of metals in a water system comprising maintaining in the water of said system at least about 5 ppm of a composition comprising zinc and at least one low molecular weight polymer selected from the group consisting of polyacrylamide, poly acrylic acid and sodium polacrylate.

3,885,915
METHOD AND APPARATUS FOR THE STERILIZATION OF AMPOULES WITH PHARMACEUTICAL LIQUID THEREIN

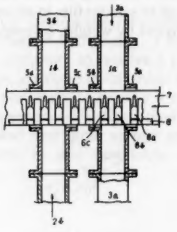
Isamu Utsumi, Kyoto; Kanae Murakami, Osaka; Teruo Murayama, Saitama, and Tokuo Takahashi, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka and Nihon Denshi Kabushiki Kaisha, Tokyo, both of, Japan

Filed Dec. 1, 1972, Ser. No. 311,434

Claims priority, application Japan, Dec. 1, 1971, 46-97434; Feb. 21, 1972, 47-18261

Int. Cl. A61l *1/00, 3/00*

U.S. Cl. 21—54 R **6 Claims**



1. A method for sterilizing liquid-containing ampoules having branch parts which comprises the steps of: inclining each ampoule containing a liquid to an angle of inclination so that the liquid does not enter the branch part of the ampoule; rotating the ampoule about its longitudinal axis while in the inclined position; and irradiating said ampoule with microwaves, so that the liquid does not enter into the branch part of the ampoule during the irradiation process.

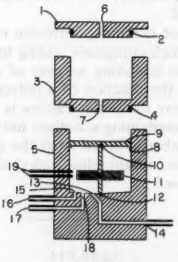
3,885,916
APPARATUS FOR DETERMINING THE WATER CONTENT OF LIQUIDS AND GASES

Albert F. Hadermann, Rt. 1, Ijamsville, Md. 21754, and Paul F. Waters, 3318 45th St. N.W., Washington, D.C. 20016

Filed Aug. 1, 1973, Ser. No. 384,563

Int. Cl. G01n *31/16, 33/18, 33/28*

U.S. Cl. 23—253 R **3 Claims**



1. An apparatus for determining the water content of a liquid or gas which consists essentially of upper and lower cylindrical cells provided with Teflon "O" ring seals to prevent the leakage of atmospheric moisture into the titration cell; the upper chamber being filled with a drying agent to ensure that air entering the titration cell upon withdrawing the fluid contents is dry; the lower chamber serving as a vessel within which the titration with Karl Fischer Reagent is performed and being fitted with a removable stirring rotor, clad with an inert protective material, located between one fixed and one removable pivot; provision for detecting the end point of the titration by a "dead-stop" technique employing two platinum electrodes in communication with the cell contents; access to the lower chamber being provided by apertures in the body of the chamber wall and fitted with nipples for connection to tubing, for connection to said nipples and serving as ducts for sample entry, reagent entry and for filling and emptying the cell contents without complete disassembly.

3,885,917
APPARATUS FOR CARRYING OUT CONTINUOUS PHYSICAL AND CHEMICAL PROCESSES IN FLUIDIZED BED OF LOOSE MATERIAL

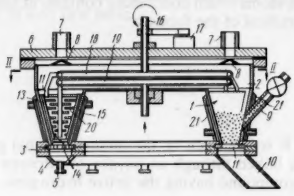
Valentina Anatolievna Osenkina, ulitsa Kurchatova, 5b, kv. 20; Viktor Borisovich Khorolsky, ulitsa Kurchatova, 9, kv. 39, and Jury Sergeevich Ippolitov, ulitsa Lapina, 9, kv. 10, all of Irkutsk, U.S.S.R.

Filed Aug. 23, 1973, Ser. No. 390,947

Claims priority, application U.S.S.R., Dec. 20, 1972, 1719485

Int. Cl. B01j *9/18*

U.S. Cl. 23—284 **13 Claims**



1. An apparatus for carrying out continuous physical and chemical processes in fluidized bed of loose material comprising: a working chamber having in a plan view a ring-shaped configuration; a bottom of said working chamber used as a gas distributing grid; partitions in said working chamber adjoining walls and said bottom of the working chamber and dividing it subsequently into separate sections; said partitions being hollow and including means for feeding a heat-carrying medium into their inner cavities and for discharging it therefrom; a common driving shaft extending vertically along the central axis of the working chamber, said shaft rigidly mounting said partitions so that they are adapted to be moved along said working chamber ensuring the movement of the loose material; means for feeding gas beneath said gas distributing grid and for discharging it from the apparatus; and unions for feeding the loose material into the working chamber and for discharging it therefrom.

3,885,918
EXHAUST GAS CLEANING APPARATUS

Fumio Isahaya, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 1, 1972, Ser. No. 285,644

Claims priority, application Japan, Sept. 10, 1971, 46-69675

Int. Cl. B01d *47/06;* **B05b** *7/00;* **C01b** *17/62*

U.S. Cl. 23—284 **18 Claims**

1. An exhaust gas cleaning apparatus comprising:

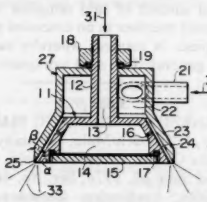
a. an inlet for directing an exhaust gas containing acid material from a source of combustion;

b. a reaction tower connected substantially at the top end with said inlet and at the other end with an exhaust gas outlet;

c. a separator having one end connected to said exhaust gas outlet and the other end with an outlet port; and

d. a two-fluid spraying device provided in said reaction tower for spraying, in the form of fine liquid particles, a liquid containing alkali material which can react with said acid material, said spraying device being provided with a

port for introducing compressed gas which is adapted to spray the liquid under pressure, said spraying device further having diverging spraying passages disposed on a

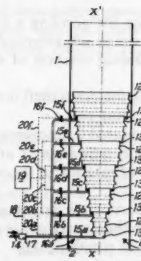


diverging conical surface, said passages being provided with separate inlets for said liquid alkali material and for said gas.

3,885,919
RESIDUAL GAS BURNER WITH SUPERIMPOSED, INCREASING SIZE BURNING CHAMBERS

Marcel T. Pillard, 6 Avenue Frederic Mistral, Marseille, 13008 France

Filed Nov. 19, 1973, Ser. No. 417,144
Claims priority, application France, Nov. 24, 1972, 72.42944
Int. Cl. F23c 9/04; F23g 7/06
U.S. Cl. 23—277 C **11 Claims**

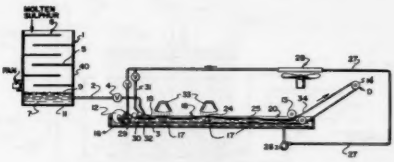


1. A device for burning residual gases comprising a plurality of vertically superposed, open-ended, co-axial tubes, each vertically successive tube having an interior volume greater than the interior volume of the tube next below to form a plurality of vertically superposed chambers of successively greater volume, the uppermost tube opening upwardly and the upper end of each other tube opening into the lower end of the tube next above, each tube also having at least a portion of the lower end thereof spaced from the upper end of the tube next below to provide air passageways between each pair of tubes, a plurality of residual gas burners, at least one at the lower portion of each tube and extending around the axis thereof, means for supplying said residual gases to said burners including control means for selectively supplying said residual gases to each said burner, means for measuring the flow of said residual gases in said supplying means and operating means responsive to said measuring means and connected to said control means for increasing the number of said burners to which said residual gases are supplied with an increase in said flow of said residual gases.

3,885,920
METHOD FOR THE SOLIDIFICATION OF MOLTEN SULPHUR

Ernest Ralph Ellithorpe, and Ronald Bruce Fletcher, both of Calgary, Alberta, Canada, assignors to Vennard & Ellithorpe Ltd., Calgary, Alberta, Canada

Division of Ser. No. 207,909, Dec. 14, 1971, Pat. No. 3,832,145. This application Mar. 4, 1974, Ser. No. 448,152
Int. Cl. C01b 17/02, 17/14
U.S. Cl. 23—293 S **5 Claims**



1. A method of solidifying molten sulphur comprising the steps of:

a. providing a movable endless member which is so surfaced as to inhibit the adherence of sulphur thereto;

b. forming on said member a plurality of separate and distinct undulations which are shaped so as to form at least three pools of molten sulphur thereon;

c. feeding molten sulphur onto said member from a feeding section at a predetermined rate such that a separate and distinct pool of molten sulphur is caused to form within each of said undulations;

d. maintaining the speed of said member in relation to the feed rate of said sulphur and in relation to the angle and length of the surface of said undulations remote from said feeding section so that molten sulphur forms into a layer and solidifies on said member as it is caused to pass through said pools and so that in continuous operation a constant level of molten sulfur in said pools is maintained;

e. providing a bath of water below said member of a depth sufficient to partially support said member and subjecting said bath water to a recirculation and cooling treatment; and

f. delivering cooled sulphur in a stage of solidification from the surface of said movable member.

3,885,921
PREPARING PURIFIED MACROMOLECULAR SOLUBLE PRUSSIAN BLUE

Yoshio Matsumoto, Fujisawa; Michiko Shirai, Tokyo; Hiroko Saito, Yokohama; Takeshi Kawashima, and Yuzuru Sakabe, both of Tokyo, all of Japan, assignors to Kitazato Gakuen, Tokyo, Japan

Filed Feb. 1, 1973, Ser. No. 328,652
Int. Cl. B01d 21/01; C01c 3/12
U.S. Cl. 23—300 **4 Claims**

1. A method of preparing a reagent for determining the void volume of a gel column, which comprises purifying a crude aqueous solution of Soluble Prussian Blue to remove inorganic substances of smaller molecular size from an inorganic macromolecular metal complex compound by admixing a concentrated aqueous solution of a member selected from the group consisting of KCl KBr and $(NH_4)_2SO_4$ with the crude solution, thus causing macromolecular particles of the Soluble Prussian Blue, $KFE^{II}Fe^{III}(CN)_6$, to precipitate out of the crude solution, and separating the precipitated macromolecular particles from the resultant mixture to obtain purified Soluble Prussian Blue.

3,885,922

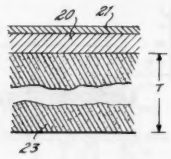
PRESSURE VESSEL AND BIMETALLIC COMPONENTS

Royal David Thomas, Jr., Narberth, and James E. Norcross, Media, both of Pa., assignors to Arcos Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 237,021, May 22, 1972, abandoned, which is a division of Ser. No. 74,974, Sept. 24, 1970, Pat. No. 3,696,228. This application Apr. 25, 1974, Ser. No. 464,065

Int. Cl. B32b *15/00*

U.S. Cl. 29—191 4 Claims



1. A heavy-walled multi-layer metallic vessel comprised of a corrosion resisting surface layer, a structural layer bonded thereto, and a plurality of increments of weld deposited layer bonded to the structural layer, in which said corrosion resisting layer is of an alloy or metal selected from the class consisting of AISI 300 series, AISI 400 series, nickel, nickel alloys, Copper Development Classification Alloys, aluminum, aluminum alloy, titanium, titanium alloy, zirconium, zirconium alloy, a refractory metal, a noble metal and a cobalt base alloy; the said structural layer is from a steel selected from the class consisting of mild carbon steels, medium carbon steels, high carbon steels, low alloy steels and medium alloy steels; and said weld deposited layer is selected from the class consisting of mild carbon steel weld metal, high carbon steel weld metal, low alloy steel weld metal and medium alloy steel weld metal, the weld deposited layer having the dendritic grain structure and metallurgical properties characteristic of electroslag deposited metal.

3,885,923

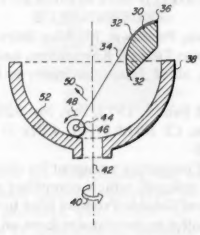
GENERATION OF CURVED SURFACES ON A WORKPIECE

Leo F. Polak, Van Nuys, and Bernard E. Kalensher, Altadena, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1974, Ser. No. 460,256

Int. Cl. B24b *13/00*

U.S. Cl. 51—33 W 6 Claims



1. A method for generating a predetermined contour on a surface of a workpiece supported on a member comprising the steps of:

providing a template having a curved surface which corresponds to the contour to be generated on the surface of said workpiece, an elongated flexible member being affixed to one end of said template curved surface and extending along the curved surface, a first contour forming member being affixed to the other end of said elongated member,

moving said contour forming member into contact with a surface of said workpiece, and

moving said elongated member in a direction away from said curved surface of said template while maintaining said elongated member in an extended position and while said workpiece is rotated, whereby said predetermined contour is generated on said workpiece surface.

3,885,924

CRANKSHAFT GRINDING MACHINE

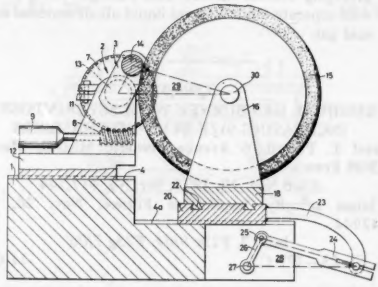
Kurt Marowsky, Offenbach/Main, Germany, assignor to Friedrich Schmaltz GmbH, Offenbach/Main, Germany

Filed June 24, 1974, Ser. No. 482,803

Claims priority, application Germany, July 2, 1973, 2333661

Int. Cl. B24b *5/42*

U.S. Cl. 51—50 R 5 Claims



1. A grinding machine for grinding a crankshaft having a main bearing pin and a crank pin arranged to revolve around the main bearing pin during rotation of the crankshaft, the machine comprising

1. means for mounting the crankshaft for rotation about the axis of the main bearing pin,
2. a grinding wheel mounted for movement in relation to the crankshaft and for rotation about an axis substantially parallel to the axis of rotation of the main bearing pin of the crankshaft,
3. a slide means supporting the grinding wheel for reciprocation in relation to the crankshaft in a direction perpendicular to the axes of rotation, and
4. a crank drive operatively connected to the slide means for reciprocating the slide means,
   a. the lengths of the cranks of the crankshaft and of the crank drive being identical and
   b. the crank drive including a push rod connected to the slide means, the length of the push rod being identical to the distance between the axis of the crank pin and the axis of rotation of the grinding wheel.

3,885,925

METHOD FOR THE SHARPENING OF FOUR FACES DRILLS AND SHARPENING MACHINE FOR CARRYING OUT THIS METHOD

Alexander Tatar, 68 Department of Haut Rhin, Hagenthal-le-Bas, France

Filed Oct. 17, 1973, Ser. No. 407,131

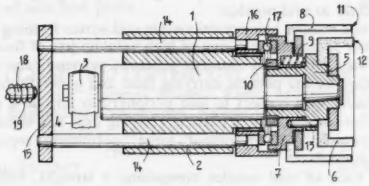
Claims priority, application Switzerland, Oct. 23, 1972, 15461/72

Int. Cl. B24b *5/36*

U.S. Cl. 51—122 5 Claims

1. Method for sharpening a four faced drill having pairs of cutting and clearance faces, the sharpening being effected with two grinding wheels respectively having grinding surfaces of different grain roughnesses, said method comprising the steps of: positioning the grinding wheels relative to each other

such that only the wheel with the rougher grain is operable on a drill face, positioning the drill relative to the wheels to present a clearance face thereof for sharpening, urging the drill to pass opposite the two grinding wheels in one direction such that the clearance face thereof contacts only the rougher grain wheel, next positioning the wheels relative to each other such



that both wheels are operable on a drill face, re-positioning the drill relative to the wheels to present a cutting face thereof for sharpening, and moving the drill in a direction opposite to said one direction such that the cutting face of the drill contacts first the rougher grain wheel and immediately thereafter the thinner grain wheel to finish the sharpening of the cutting face of the drill.

3,885,926

MODIFIED CALCIUM CHLORIDE BRINE DESICCANT

Francis S. Manning; Paul Buthod; Robert A. Hodgson, and Ibrahim Bagci, all of Tulsa, Okla., assignors to Maloney-Crawford Tank Corporation, Tulsa, Okla.

Filed June 26, 1974, Ser. No. 483,211
Int. Cl. B01d *53/02, 53/14*
U.S. Cl. 55—29 **1 Claim**

1. The method of dehydrating gaseous petroleum hydrocarbons by passing them through a solution of 100 parts of 50 weight percent calcium chloride plus 15 parts magnesium nitrate.

3,885,927

PROCESS FOR REMOVING CARBON DIOXIDE FROM GAS STREAMS

John Delano Sherman, Chappaqua, and Ronald Jay Ross, Upper Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 5, 1974, Ser. No. 439,711
Int. Cl. B01d *53/02*
U.S. Cl. 55—68 **3 Claims**

1. Process for removing carbon dioxide from gas streams which comprises providing a gas stream comprising nitrogen and carbon dioxide, said gas stream containing not more than about 1000 ppm by volume of carbon dioxide, passing said gas stream through an adsorption zone at a temperature of from −40°F to + 120°F at a pressure of from about 6 to 170 atmospheres and at a feed rate of from 5000 to 5,000,000 standard cubic feet per hour, said adsorption zone containing the barium cation form of zeolite X in which the BaO/Al_2O_3 molar ratio is at least 0.90, whereby the carbon dioxide is selectively adsorbed and the effluent from the adsorption zone is substantially free of carbon dioxide.

3,885,928

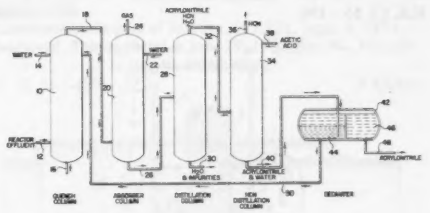
ACRYLONITRILE AND METHACRYLONITRILE RECOVERY AND PURIFICATION SYSTEM

Hsin Chih Wu, Parma, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed June 18, 1973, Ser. No. 371,043
Int. Cl. B01d *47/02*
U.S. Cl. 55—85 **6 Claims**

1. In the process for the recovery and purification of acrylonitrile or methacrylonitrile obtained by the ammoxidation of propylene or isobutylene wherein

a. the reactor effluent is directly contacted with an aqueous stream to cool the gases in a quench column;
b. the acrylonitrile and HCN are recovered in the form of an aqueous solution;
c. some of the water and impurities are removed by distillation to form a concentrated aqueous mixture of acrylonitrile and HCN;



d. the aqueous mixture of acrylonitrile and HCN is distilled in an HCN distillation column to remove the HCN in an overhead stream; and
e. a side stream in the HCN distillation column are fed to a decanter where an aqueous layer and an organic layer are formed, the improvement comprising

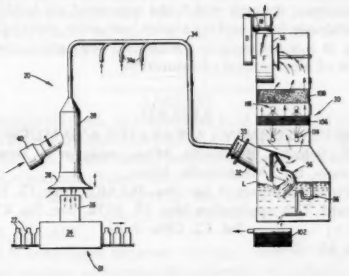
removing the aqueous layer from the decanter and recycling the aqueous layer to the quench column where it is directly contacted with the reactor effluent.

3,885,929

METHOD AND APPARATUS FOR CLEANING EXHAUST GAS

Richard S. Lyon, Carroll, Ohio, and Ralph L. Lyon, Wheaton, Ill., assignors to United McGill Corporation, Columbus, Ohio

Division of Ser. No. 171,686, Aug. 13, 1971, Pat. No. 3,789,109. This application Oct. 26, 1973, Ser. No. 410,206
Int. Cl. B01d *47/02*
U.S. Cl. 55—87 **51 Claims**



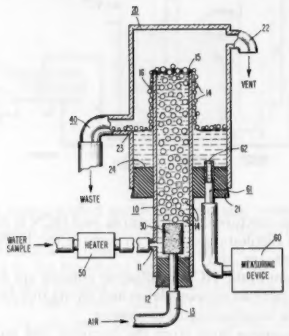
1. A method of cleaning a hot polluted gas comprising spraying a liquid into the hot gas to rapidly cool the gas, passing the cooled gas into a first scrubbing stage in which the gas is directed through the upper portion of a liquid bath and is vigorously mixed with liquid from the bath as it flows through a tortuous, scroll type passageway, with at least some of the pollutants and liquids entrained in the gas separating from the gas and falling into the bath as the gas leaves the scroll type passageway, then passing the gas through a second scrubbing stage formed by a scrubber pad which intersects the flow path of the gas, and continously wetting the scrubber pad

to enhance separation of the remaining pollutants from the gas as it passes through the pad.

3,885,930
APPARATUS FOR REMOVING AIR-IN-EXCESS-OF-SATURATION FROM WATER SAMPLES TO BE MEASURED

Carl C. Scheerer, 1442 Heather Ln., West Chester, Pa. 19380

Filed Apr. 30, 1974, Ser. No. 465,534
Int. Cl. B01d *19/00*
U.S. Cl. 55—196 **6 Claims**

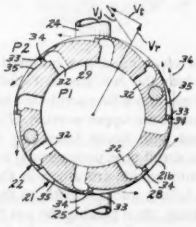


1. Apparatus adapted for use in removing air-in-excess-of-saturation from a water sample to be measured, comprising:
an air-sweep container, having an inlet through which the water sample to be measured enters, and having an outlet through which the water sample to be measured exits;
an air-release stone, positioned within said air-sweep container such that air bubbles emanating from said air-release stone sweep through the entirety of a water sample present within said air-sweep container;
a separation container, positioned so as to receive combined water sample, air bubble effluent from the outlet of said air-sweep container, adapted to permit the floatable separation of the air bubbles from the water sample; and overflow withdrawal means, attached to said separation container, through which the separated air bubbles are withdrawn from said separation container, thereby resulting in a water sample within said separation container free of air-in-excess-of-saturation.

3,885,931
VORTEX FORMING APPARATUS AND METHOD

Robin E. Schaller, Burnsville, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 261,602, June 12, 1972, abandoned. This application May 30, 1974, Ser. No. 474,364
Int. Cl. B04c *3/00*
U.S. Cl. 55—261 **8 Claims**

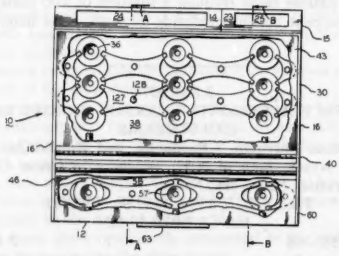


1. Apparatus for inertially separating particles from a fluid medium, comprising:
a. a chamber having an inlet for a flow of particle carrying fluid, and an outlet;
b. a ring-like vortex forming member mounted in said chamber between said inlet and outlet, having a central opening and an outer periphery, passage means including a plurality of spaced nozzles leading from said central opening to said outer periphery, and conduit means connected to said central opening for supplying high pressure fluid to said nozzles;
c. said nozzles being positioned in said vortex forming member to discharge a ring of high velocity jets of fluid outwardly into said chamber generally perpendicular to the flow of the particle carrying fluid and generally tangentially with respect to said periphery to impose a vortex flow on the flow of particle carrying fluid and submit the particles to centrifugal force, permitting separation thereof;
d. each of said nozzles comprising a straight, orifice of length no greater than its diameter configured to restrict the flow of fluid and generate a jet of substantially sonic velocity when supplied with fluid at a suitable pressure; and
e. said periphery of said vortex forming member having curved ramp surface means formed adjacent each nozzle to enhance the Coanda effect on each said jet to enhance attachment of the jet to said periphery of the vortex forming member.

3,885,932
DUST FILTRATION SYSTEM

Lionel G. Moore, Jr., and Thomas P. Flynn, both of Milwaukee, Wis., assignors to Super Products Corporation, Milwaukee, Wis.

Filed Jan. 10, 1974, Ser. No. 432,243
Int. Cl. B01d *46/44*
U.S. Cl. 55—314 **7 Claims**



1. A vacuum loading or cleaning device comprising:
a material receiving chamber, said chamber including inlet means and outlet means,
vacuum pump means connected to said chamber outlet means for creating a vacuum in said chamber and for drawing a high velocity air stream from said chamber inlet means through said chamber to said chamber outlet means,
filter means interposed between said chamber and said pump means for filtering fine particulate material from the air stream passing from said chamber to said pump means, said filter means comprising:
a housing having two inlet means coupled with said chamber outlet means and a housing outlet means coupled to said vacuum pump means,
air stream directing means within said housing defining two air stream flow paths through said housing, one of said flow paths connecting one of said housing inlet means to said housing outlet means and the other of said flow paths connecting the other of said housing inlet means to said housing outlet means,
filters in said housing for filtering fine particulate material from the air stream passing through said housing, said

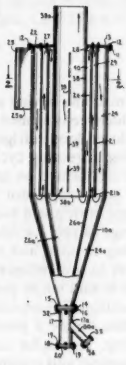
filters comprising a first and a second portion, said first portion and said second portion of said filters being arranged in said housing for filtering in series the air stream passing through said first flow path, said second flow path bypassing said first portion of said filters but including said second portion of said filters means for selectively controlling the air flow from said chamber outlet means to said housing outlet means through one of said flow paths.

3,885,933

CLASSIFYING CENTRIFUGAL SEPARATOR

David H. Putney, Shawnee Mission, Kans., assignor to Stratford Engineering Corporation, Kansas City, Mo.

Filed Sept. 20, 1974, Ser. No. 507,667
Int. Cl. B01d 45/12
U.S. Cl. 55—397 4 Claims



1. A classifying separator for removing entrained particles from gaseous materials comprising:

a vertical outer vessel shell having an upper cylindrical portion and closed at the top thereof and tapered downwardly at the bottom thereof to form a first restricted bottom discharge opening for the removal of solids;

a first cylindrical sleeve concentrically positioned within the first vessel and spaced inwardly thereof with its upper end fixed in an air sealing relation to the top of the first vessel and its lower end free therewithin, whereby to provide a first circular annulus between the shell and first sleeve open at its lower end;

a vertical inner vessel shell having an upper cylindrical portion concentrically positioned within said first sleeve and spaced inwardly thereof, said inner shell tapered downwardly at the bottom thereof to form a restricted air sealed bottom discharge for said inner vessel;

the inner vessel shell spaced downwardly from the top of the outer shell to provide a continuous, circumferential gap thereover for passage inwards thereof of gas and gas entrained solids;

the inner shell and first sleeve providing therebetween a second circular annulus open at its lower end;

a second cylindrical sleeve concentrically positioned within the second shell and spaced inwardly therefrom and above the tapered portion of said inner vessel whereby to provide a third circular annulus between said inner vessel shell and second sleeve open at its lower end;

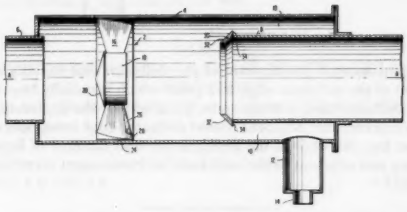
the upper end of said second sleeve penetrating the outer vessel shell top closure to provide a gas discharge outlet; an inlet connected tangentially into the upper portion of said outer vessel shell for introducing gases and entrained solids to the first annulus, and substantially vertically oriented slotted passageways in the walls of the first and second sleeves for removing solids from the gaseous materials passing through the second annulus and inner sleeve, respectively.

3,885,934

CENTRIFUGAL TUYERE FOR GAS SEPARATOR

Ralph Eads, and Charles Langdon Campbell, both of Houston, Tex., assignors to Heat/Fluid Engineering Corporation, Tulsa, Okla.

Continuation-in-part of Ser. No. 177,251, Sept. 2, 1971, abandoned. This application June 19, 1973, Ser. No. 371,426
Int. Cl. B01d 45/12
U.S. Cl. 55—457 9 Claims



1. A centrifugal tuyere for removing entrained liquids from a gas stream, comprising,

a plurality of blades extending radially with respect to the central longitudinal axis of the tuyere, each of said blades having upstream and downstream faces which are inclined with respect to planes which lie perpendicular to the central longitudinal axis of the tuyere to impart a rapid helical motion to the gas stream deflected thereby, each of said blades having a leading edge at its upstream end and a trailing edge at its downstream end,

each blade having a lip extending along its trailing edge,

said lip projecting in an upstream direction therefrom to make an acute angle with said blade to trap liquid which is on the blade and lead the trapped liquid radially outwardly on the blade, said lip terminating at a point radially inwardly of the outer edge of the blade to provide the outer end of the blade with an unobstructed liquid draining space located to permit liquid trapped by the lip to be released from the blade to impinge upon and flow along the inner wall of a vessel housing the tuyere.

3,885,935

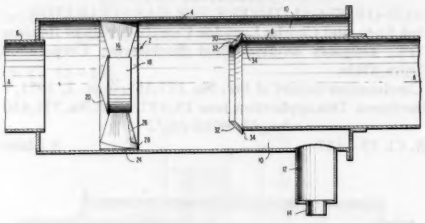
CENTRIFUGAL APPARATUS FOR SEPARATING ENTRAINED LIQUIDS FROM A GASEOUS STREAM

Dale E. Nutter, Tulsa, Okla., assignor to Heat/Fluid Engineering Corporation, Tulsa, Okla.

Filed June 19, 1973, Ser. No. 371,425
Int. Cl. B01d 45/12
U.S. Cl. 55—457 13 Claims

1. In a centrifugal separator having a central longitudinal axis and a tuyere provided with a plurality of radiating blades extending from the central axis; each of said blades having a leading edge, a trailing edge, a root end, a tip end, and upstream and downstream faces which are inclined with respect to the central longitudinal axis and to planes lying perpendicular thereto, whereby a gaseous stream passing through the separator is given a helical motion to throw entrained particles of liquid radially outwardly; the improvement which comprises a deflector, means locating said deflector forwardly of the upstream faces of the blades in the path of the gaseous stream, said deflector having an upstream face which terminates at its periphery in an edge positioned directly upstream of the upstream faces of the blades to release liquid from the deflector onto the upstream faces of the blades, said deflector

being devoid of any liquid supporting surface extending downstream from said deflector edge, said deflector having a downstream face which is located upstream of said blades, each of said blades having its root end located entirely downstream of the deflector and radially inward of the deflector edge, each of said blades having its leading edge extending radially from



a point located downstream of the deflector and radially inward of the deflector edge to a point which is radially beyond the deflector and is at the outer periphery of the tuyere, said downstream face adjacent to said deflector edge being spaced from the root ends of the blades to prevent the flow of liquid along and adjacent to the root ends for consequent reentrainment.

3,885,936

HEAT EXCHANGERS

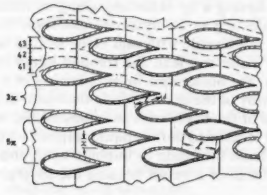
Gerald John Nicholson Limebeer, Johannesburg, South Africa, assignor to Basil Gilbert Alfred Lund, Johannesburg, South Africa, a part interest

Filed Feb. 21, 1973, Ser. No. 334,215

Claims priority, application South Africa, Mar. 1, 1972, 72/1381

Int. Cl. F28f *1/02, 13/06*

U.S. Cl. 62—304 **13 Claims**



1. A heat exchanger comprising a multiplicity of tubes extending between tube sheets for a first fluid to flow in the tubes and a second fluid to flow past the tubes in a direction normal to an aperture plane, and in which:

a. the tubes are in a plurality of rows parallel to the aperture plane and parallel to one another;

b. each tube is of a symmetrical aerofoil section with a cuspate trailing edge, with its chord plane normal to the aperture plane, is formed within a continuous aerofoil shape from end to end so that there are no heat transfer surfaces extending into the path of the second fluid, and has a fineness ratio between 6:1 and 2:1;

c. the tubes are so shaped and rows of tubes are so positioned that the nose of a tube in a trailing row of tubes intercallates between the trailing edges of pairs of tubes in the leading row so that between adjacent trailing and leading tubes passages of substantially constant width along their lengths in the direction of flow of the second fluid are formed:

d. each row is off-set with respect to the row leading it to such an extent that the constant width passage to one side of a tube is substantially twice the width of the constant width passage to the other side of it.

3,885,937

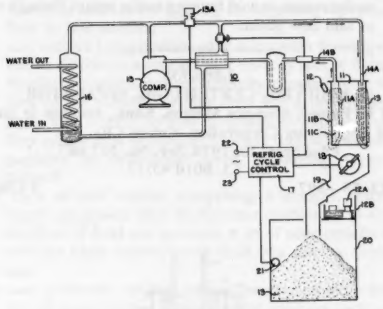
ICE MACHINE CONTROL MECHANISM

Russel W. Norris, 1911 Chaparral, Houston, Tex. 77043

Filed Jan. 12, 1973, Ser. No. 323,209

Int. Cl. F25c *1/12*

U.S. Cl. 62—137 **2 Claims**



1. In an ice making machine having a double walled cylindrical evaporator on which ice is formed from water deposited on the evaporator, a closed loop refrigeration system including a timer for providing a freezing cycle for such water and a harvest cycle for the ice formed on said evaporator, an ice crusher located below said evaporator for crushing ice as it falls from the evaporator during said harvest cycle, an ice bin for collection and storage of said ice and having a thermostat which includes a sensing element and a switch element connected to shut off power to said refrigeration system for sensing the level of said ice in said bin to provide a stop signal for stopping the further making of ice on said evaporator until the ice in the bin has fallen below a predetermined level, the improvement comprising, means for causing the in process cycle of freezing, harvesting, and crushing the ice to be completed when said stop signal is provided prior to the end of a freeze cycle, said means comprising a control switch shunting said switch element, said control switch including the contacts of a relay connected so that said contacts are closed during the freeze cycle irrespective of the state of said thermostat switch element.

3,885,938

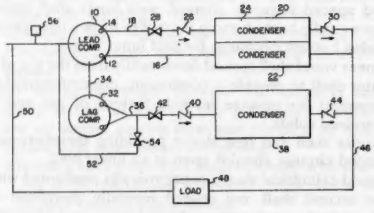
REFRIGERATION SYSTEM WITH CAPACITY CONTROL

Carlos R. Ordonez, Staunton, Va., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 18, 1974, Ser. No. 434,756

Int. Cl. F25b *41/00*

U.S. Cl. 62—196 **9 Claims**



1. The combination of a refrigeration system including an unloadable, hermetic shell, multi-cylinder compressor having an always loaded discharge port and an unloadable discharge port, and a non-unloading, hermetic shell, multi-cylinder compressor, said shells of said compressors being connected

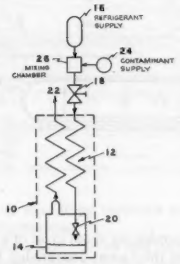
to receive suction gas returned from said system and being in open communication with each other, a condenser arrangement including a split condenser coil having one part connected by a first line to said always loaded discharge port, and another part connected by a second line to said unloadable discharge port, and another condenser connected by third line means to the discharge of said non-unloading compressor, and means to effect isolation from the remainder of said refrigeration system, of the inlet and outlet of said another part of said split condenser during operation of said unloadable compressor in an unloaded mode, and of the inlet and outlet of said another condenser during periods of non-operation of said non-unloading compressor.

3,885,939

CRYOSTAT CONTROL

Arvel Dean Markum, San Juan Capistrano, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Apr. 25, 1974, Ser. No. 464,078
Int. Cl. F25b *43/00*
U.S. Cl. 62—474 **1 Claim**



1. In combination:
a cryostat including a coiled tube heat exchanger;
a high pressure refrigerant gas supply to provide a refrigerant to said cryostat, said refrigerant comprising a mixture of 16% Freon-14 and 84% Freon-23; and
means to introduce a contaminant into the refrigerant for said cryostat, said contaminant comprising 10 parts per million by weight water vapor, said contaminant having a solidification point above that of the refrigerant to alternately freeze and melt in the coiled tube heat exchanger of said cryostat to reduce the flow of refrigerant through said cryostat.

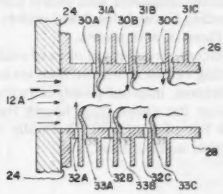
3,885,940

FIBER TORATION; METHOD AND EQUIPMENT

Marcel Levecque, Saint-Gratien; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, all of France

Filed Apr. 24, 1973, Ser. No. 353,984
Claims priority, application France, Mar. 30, 1973, 73.11525
Int. Cl. C03b *37/04*
U.S. Cl. 65—5 **28 Claims**

6. A method for making glass fibers from molten glass, comprising establishing a gaseous blast, delivering molten glass to a glass supply slot arranged adjacent a boundary of the blast, and causing the glass to be delivered from said slot at a plurality of zones spaced along the slot by directing a plurality



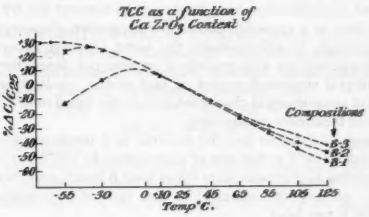
of gaseous jets of smaller cross section than the blast through said boundary upstream of the slot.

3,885,941

METHOD OF FORMING A GLASS-REACTED-CERAMIC COMPONENT

Galeb H. Maher, Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 20, 1974, Ser. No. 453,136
Int. Cl. C03c *21/00*
U.S. Cl. 65—18 **6 Claims**



1. A method of making a glass-reacted-ceramic body comprising mixing a major proportion of a finely ground prefired titanate ceramic containing a zirconate and niobium oxide which ceramic matures above 2,000°F, and a minor proportion of a powdered low temperature glass containing cadmium oxide, mixing the powder combination of said ceramic and said glass with a suspension medium, depositing the suspension and firing the deposit in air at between 1,800° and 2,050°F for at least 1 hour at temperature so as to mature said body and cause cadmium ions from said glass to react with said ceramic and to diffuse into the titanate lattice, whereby grain growth in said body is enhanced and the Curie temperature of said body is shifted downwardly.

3,885,942

METHOD OF MAKING A REINFORCED HEAT EXCHANGER MATRIX

Gary Lee Moore, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

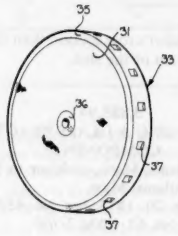
Filed Feb. 16, 1973, Ser. No. 333,380
Int. Cl. C03c *23/20*; C03b *29/00*
U.S. Cl. 65—33 **7 Claims**

1. The method of making a reinforced heat exchanger matrix product comprising
arranging a plurality of tightly packed axially elongated tubes of a thermally crystallizable glass in a peripherally restraining fixture, each of the tubes having its opposite ends sealed and each defining a central internal chamber containing a heat expansible fluid,
heating the restrained tubes to a temperature above the softening point of the glass tubes, the internal pressure

generated in said chambers thereof during said heating expanding the tubes into a fused integral mass,

opening the opposite ends of the fused tubes to convert their said internal chambers into plural central, internal passages extending through the fused matrix, and provide opposite end faces of said matrix,

filling plural, adjacent, preselected ones of said central tube passages defining two or more end face areas of the fused matrix, said central, internal passages being completely filled throughout the entire axial length thereof, with a finely divided frit of the same thermally crystallizable glass composition as said tubes, and



thermally processing the matrix and frit through nucleation and crystallization heat treatment to convert the frit and matrix to a monolith of the low expansion glass-ceramic materials of substantially the same thermal expansion characteristics and provide a preselected, strengthened, integral structural region of said matrix product having said same thermal characteristics as the fused matrix, said heat treatment comprising

heating said matrix and frit material to a temperature of at least 2,100°F at the rate of approximately 100°F per hour, holding said temperature for at least 6 hours, and thereafter cooling the material at the rate of approximately 100°F per hour.

3,885,943

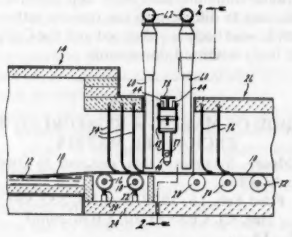
METHOD OF CUTTING GLASS WITH A LASER

Granger K. Chui, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed July 1, 1974, Ser. No. 484,903

Int. Cl. C03b *21/02*

U.S. Cl. 65—97 **5 Claims**



1. A method of cutting glass by use of a focused laser beam which comprises the steps of:

heating a glass sheet having an upper surface and a lower surface to a temperature in the range of from about 1,000°F to about 1,250°F;

developing at least a threshold power level in the focused beam, the laser beam having a wave length above 5 microns;

positioning the focal point of the focused laser beam at a location spaced from one of the surfaces of the glass sheet such that an optimum laser beam spot size is formed on the upper surface of the glass sheet, the beam spot size being such that at normal glass cutting speeds glass vaporization by the laser beam is at a rate faster than the feeding rate of adjacent glass into the space vacated by glass vaporization;

and moving the glass to be cut and annealing laser beam relative to one another at a traverse velocity not exceeding that calculated by the formula $V = P/4.88h^2$, where V is transverse velocity in inches per minute, P is laser power in kilowatts, and h is glass thickness in inches.

3,885,944

METHOD OF MAKING SHEET GLASS

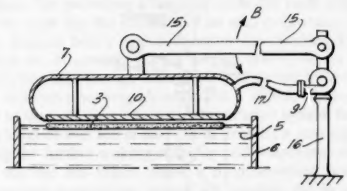
Valentin Stingelin, Aire, Ge, Switzerland, assignor to Battelle Memorial Institute, Carouge/Geneve, Switzerland

Continuation-in-part of Ser. No. 126,789, March 22, 1971, Pat. No. 3,749,563. This application May 21, 1973, Ser. No. 361,942

Claims priority, application Switzerland, Mar. 24, 1970, 4459/70The portion of the term of this patent subsequent to July 31, 1990, has been disclaimed.

Int. Cl. C03b *18/02*

U.S. Cl. 65—99 A **5 Claims**



1. A method of producing sheet glass of a thickness less than normal equilibrium thickness, comprising the steps of:

casting a layer of molten glass upon a predetermined surface area of a fluidic support;

placing a solid structure with a flat underside above said surface area with clearance from said layer to define a limited space therebetween;

generating a descending and laterally inwardly converging peripheral gas curtain around said space above at least a portion of said layer while allowing the gas to escape freely into the surrounding atmosphere on all sides, thereby building up in said space an above-ambient dynamic pressure spreading across said portion and reducing its thickness; and

continuously advancing said layer across said space.

3,885,945

METHOD OF AND APPARATUS FOR ELECTRICALLY HEATING MOLTEN GLASS

Vernon Chester Rees, deceased, late of Newark, Ohio (by Bettie Jane Rees, administratrix), and Magnus Laird Froberg, Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 20, 1974, Ser. No. 452,900

Int. Cl. C03b *5/16*

U.S. Cl. 65—136 **11 Claims**

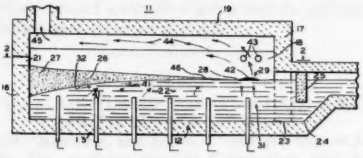
1. A continous glass melting furnace comprising:

a melting and refining tank having a batch delivery region, a glass refining region undivided from said batch delivery region and spaced across the surface of the glass constituents to be contained therein from said batch delivery region, and a molten glass issuing region in said glass refining region;

said tank having a first side wall remote from said glass issuing region and in part defining said batch delivery region, and having a second and third side walls extending from said first side wall and in part defining said batch delivery region;

a plurality of batch delivery means located in the batch delivery region for progressively feeding and distributing batch along the entire length of said first wall into said batch delivery region to advance a cover of batch extending between said second and third walls across the surface of the molten glass constituents in said tank toward said molten glass issuing region to a leading edge intersecting a free surface of exposed molten glass, the free surface of exposed batch cover covering a preponderance of the molten glass within said tank;

an array of electrodes extending into the molten glass within said tank and distributed between said batch delivery and glass issuing regions of said tank to provide the preponderance of the heat energy for melting batch materals therein;



a top on said tank extending between said batch delivery and glass issuing regions;

said furnace having a flue port in said batch delivery region above the level attained by batch, and said top defining an open gas flow path from said glass issuing region to said flue port; and

active means for applying heat energy located above the glass constituents only in the region above said glass issuing region, said means being limited in its heating capacity to apply only sufficient heat to said free surface of exposed molten glass to promote release through said free surface of exposed molten glass of gas evolved from said melted material to the atmosphere beneath said top whereby the evolved gas and atmosphere, as it flows toward said flue port, progressively releases heat energy to the upper surface of the mass of batch to preheat the upper surface of said batch and to cool the evolved gas and atmosphere substantially below the melting temperature of the batch prior to its entry into said flue port.

3,885,946

PROCESS FOR REDUCING THE CONCENTRATION OF FERTILIZER PARTICULATES IN EXHAUST STACK GASES

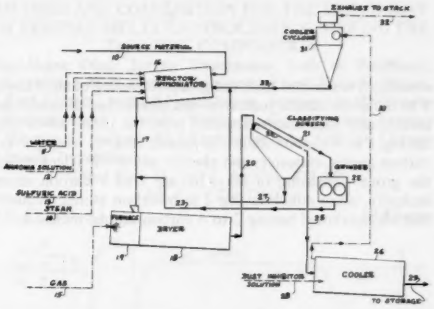
James E. Seymour, Virginia Beach, Va., assignor to Royster Company, Norfolk, Va.

Continuation of Ser. No. 83,105, Oct. 22, 1970, abandoned. This application May 11, 1973, Ser. No. 359,267

Int. Cl. C05c *7/00*

U.S. Cl. 71—30 **25 Claims**

1. In the manufacture of fertilizer compositions, wherein fertilizer particulates are heat dried and air cooled, the process for reducing the emission of fertilizer dust to the atmosphere in the cooling phase of the operation, which comprises spraying the air-borne fertilizer particulates with an aqueous



solution of a nitrogen-containing salt at the intake feed of said cooling phase.

3,885,947

META-ANILIDE UREAS AS ALGICIDAL AGENTS

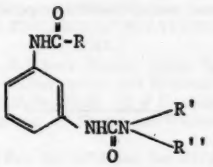
Don R. Baker, Orinda; Eugene G. Teach, El Cerrito, both of Calif., and Duane R. Arnekley, Antelope, Mont., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 9, 1973, Ser. No. 349,529

Int. Cl. A01n *9/20*

U.S. Cl. 71—67 **37 Claims**

1. The method for inhibiting and preventing algae growth in water, which comprises adding to the algae environment an algicidally effective amount of a compound of the formula



wherein R is selected from the group consisting of alkyl having 1 to 8 carbon atoms, inclusive, haloalkyl having 1 to 4 carbon atoms, inclusive, 2,4-dichlorophenoxymethylene, monochlorophenyl, dichlorophenyl and the sodium salt of pentafluoroethyl; R′ is selected from the group consisting of hydrogen, lower alkyl having 1 to 4 carbon atoms, inclusive, and lower alkoxy having 1 to 4 carbon atoms, inclusive, R″ is lower alkyl having 1 to 4 carbon atoms, inclusive.

3,885,948

META-SUBSTITUTED ETHER ANILIDES AS ALGICIDAL AGENTS

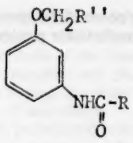
Don R. Baker, Orinda; Eugene G. Teach, El Cerrito, both of Calif., and Duane R. Arnekiev, Antelope, Mont., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 4, 1973, Ser. No. 321,085

Int. Cl. A01n *9/20*

U.S. Cl. 71—67 **28 Claims**

1. The method for inhibiting and preventing algae growth in water, which comprises adding to the algae environment an algicidally effective amount of a compound of the formula



wherein R is selected from the group consisting of alkyl having 1 to 6 carbon atoms, inclusive, and mono- and di-substituted amino, said substituents selected from the group lower alkyl having 1 to 4 carbon atoms, inclusive, alkenyl having 2 to 4 carbon atoms, inclusive, and phenyl; and R'' is selected from the group consisting of alkyl having 1 to 7 carbon atoms, inclusive, alkoxyalkyl having 2 to 6 carbon atoms, inclusive, and alkylcarbonyl having 2 to 6 carbon atoms, inclusive.

3,885,949

METHOD FOR IMPROVEMENT OF CITRUS FRUITS IN QUALITY

Masayuki Ono, Osaka, Japan, assignor to Tanabe Seiyaku Co., Limited, Osaka, Japan

Continuation-in-part of Ser. No. 47,594, June 18, 1970, abandoned. This application Jan. 29, 1973, Ser. No. 327,796

Claims priority, application Japan, June 18, 1970, 45-48752

Int. Cl. A01n *9/00*

U.S. Cl. 71—79 **11 Claims**

1. A method for decreasing the acid content of the fruit of a citrus fruit tree comprising the steps of applying to the foliage of the tree, at the period of ovary enlargement of the fruit, at least one enzyme selected from the group consisting of protease, lipase, naringinase and hesperidinase.

3,885,950

COMPOSITION AND METHOD FOR INFLUENCING THE GROWTH OF PLANTS

Bodo Ehrig; Hermann Wolz, both of Leverkusen, and Claus Hentschel, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 8, 1971, Ser. No. 160,962

Claims priority, application Germany, July 28, 1970, 2037289

Int. Cl. A01n *9/00*

U.S. Cl. 71—85 **13 Claims**

1. Method of increasing, stimulating and promoting the growth of plants which comprises applying to the soil of plants a dispersion comprising a dispersant, and, as an active ingredient, from 50 to 750 grams of an organic polymeric material selected from the group consisting of polybutadiene, a copolymer of butadiene, styrene and acrylic acid, a coplymer of n-butylacrylate, acrylamide, styrene and acrylic acid, a copolymer of butadiene, styrene and metharcylic acid, copolymer of butadiene, stryene and acrylonitrile and a copolymer of n-butylacrylate, acyrlamide, metharcylic acid amide N-methylolmethyl ether, styrene and acrylic acid.

3,885,951

PLANT GROWTH REGULANT COMPOSITIONS CONTAINING 2-HALOETHANESULPHINIC ACID COMPOUNDS

Wolfgang Hofer, Wuppertal-Vohwinkel; Klaus Lurssen, Konigsdorf, and Robert Rudolf Schmidt, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

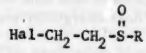
Filed Feb. 29, 1972, Ser. No. 230,505

Claims priority, application Germany, Mar. 6, 1971, 21107733

Int. Cl. A01d *9/14*

U.S. Cl. 71—103 **9 Claims**

1. Method of influencing the growth of plants which comprises applying plant growth regulatingly effective amounts of a 2-haloethanesulphinic acid compound of the formula



in which

Hal is halogen, and

R is halogen, hydroxyl, alkoxy or haloalkoxy of from 1 to 8 carbon atoms, or cycloalkoxy of up to 12 carbon atoms.

3,885,952

HERBICIDAL 2-HALO-N-(ACYLOXYALKYLENE) ACETANILIDES

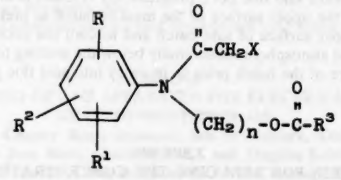
John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 204,330, Dec. 2, 1971, Pat. No. 3,832,383, which is a continuation-in-part of Ser. No. 148,894, June 1, 1971, Pat. No. 3,830,829. This application Nov. 30, 1973, Ser. No. 420,724

Int. Cl. A01n *9/24*

U.S. Cl. 71—106 **10 Claims**

1. A herbicidal composition comprising an adjuvant and an effective amount of a compound of the formula:



wherein:

R and R^1 are hydrogen, alkyl or alkoxy having at least 1 and not more than 10 carbons atoms and can be like or unlike,

R^2 is hydrogen, alkyl or alkoxy having at least 1 and not more than 10 carbon atoms, NO_2 or halogen,

R^3 is nitroaryl, hydroxyaryl, and nitro-substituted hydroxyaryl having at least 6 and not more than 24 carbon atoms;

X is chlorine, bromine or iodine, and

n is an integer of 1 or 2.

3,885,953
META-UREIDOPHENYL N-HALOALKYL CARBAMATES AS HERBICIDES

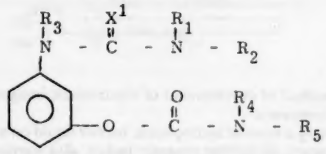
Kenneth P. Dorschner, and James A. Albright, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 211,118, Dec. 22, 1971, Pat. No. 3,806,537. This application Jan. 28, 1974, Ser. No. 436,908

Int. Cl. A01n *9/24*

U.S. Cl. 71—106 **9 Claims**

1. A herbicidally effective composition comprising an inert carrier and 1–98% of a carbamate of the formula:



wherein X^1 represent oxygen or sulfur; R_1 and R_3 represent hydrogen or a lower alkyl group, R_2 represents a lower alkyl group, R_4 represents either hydrogen, a lower alkyl group or a halogen-substituted lower alkyl group and R_5 represents a halogen-substituted lower alkyl group.

3,885,954
META-3-ALKOXYUREIDOPHENYL N-HALOALKYL CARBAMATES AS HERBICIDES

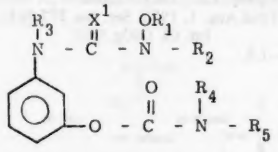
Kenneth P. Dorschner, and James A. Albright, both of Jacksonville, Fla., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 211,111, Dec. 22, 1971, Pat. No. 3,806,536. This application Jan. 28, 1974, Ser. No. 436,909

Int. Cl. A01n *9/24*

U.S. Cl. 71—106 **5 Claims**

1. A herbicidally effective composition comprising an inert carrier and 1–98% of a carbamate of the formula:



wherein X^1 represents either oxygen or sulfur; R_1 and R_2 are the same or different lower alkyl groups, R_3 is a lower alkyl group or hydrogen, R_4 is a lower alkyl group, hydrogen or a halogen-substituted lower alkyl group and R_5 is a halogen-substituted lower alkyl group.

3,885,955
PROCESS FOR THE PRODUCTION OF GOLD POWDER

Klaus Lutz, Bergen-Enkheim, and Manfred Golla, Grossauheim, both of Germany, assignors to Demetron Gesellschaft fur Elektronik-Werkstoffe mbH, Germany

Filed June 10, 1974, Ser. No. 478,037

Claims priority, application Germany, June 8, 1973, 2329352

Int. Cl. C22b *11/04, 11/06*

U.S. Cl. 75—.5 A **14 Claims**

1. A process of preparing gold powder of predetermined particle size, particle shape and specific surface area comprising precipitating chloroauric III acid from an aqueous hydrochloric acid solution thereof with ammonia, preparing a suspension of the precipitate in a liquid without drying and reducing the gold in said suspension to free metal with a reducing agent.

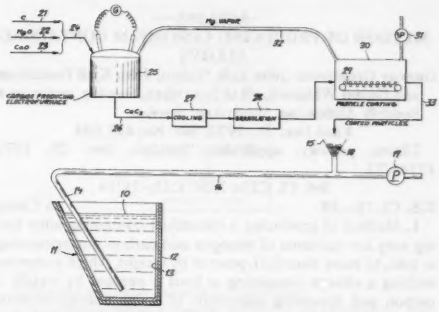
3,885,956
METHOD AND COMPOSITION FOR THE TREATMENT OF FERROUS MELTS AND PROCESS FOR MAKING THE TREATING COMPOSITION

Karl-Heinz Obst; Jurgen Stradtmann, both of Wuelfrath, Germany; Paul Metz, Luxembourg, and Francis Meyer, Esch, Alzette, both of Luxembourg, assignors to Rheinische Kalksteinwerke GmbH, Wulfrath, Germany and Acieries Reunies de Burbach-Eich-Dudelange S.A., ARBED, Luxembourg, Luxembourg

Filed May 21, 1974, Ser. No. 471,908

Int. Cl. C21c *7/00*

U.S. Cl. 75—53 **10 Claims**



1. A method of desulfurizing a ferrous melt comprising the steps of introducing into said melt particles of a size between 0.3 and 5mm and having a core of calcium carbide coated with a metal sheath of magnesium constituting 5 to 25 percent by weight of the particles.

3,885,957
METHOD FOR THE DESULFURIZATION OF A STEEL MELT

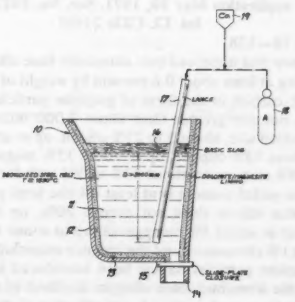
Helmut Richter; Eckehard Forster; Edgar Spetzler; Jochen Wendorff, all of Oberhausen, and Heinrich-Wilhelm Rommerswinkel, Mulheim, Ruhr, all of Germany, assignors to Thyssen Niederrhein AG Hutten-und-Walzwerke, Oberhausen, Germany

Filed Feb. 20, 1973, Ser. No. 333,690

Claims priority, application Germany, Mar. 1, 1973, 2209902

Int. Cl. C21c *7/00*

U.S. Cl. 75—58 **11 Claims**



1. A method of desulfurizing a deoxidized steel melt, comprising the steps of:

covering the deoxidized steel melt with a basic-slag layer containing at most 4 percent by weight FeO;

introducing at a location at least 2,000 mm below the surface of the deoxidized steel melt covered with said basic slag layer a stream of a calcium-containing substance in finely divided form in a neutral carrier gas;

maintaining the temperature of said melt during the introduction of said calcium-containing substance thereto at at least 1,530°C,

maintaining said molten steel in contact with a lining containing at least 70 percent by weight aluminum oxide during introduction of the calcium-containing substance thereto; and

the introduction of said calcium-containing substance is carried out so that said steel melt contains at least 0.015 percent by weight aluminum.

3,885,958
METHOD OF PRODUCING CHROMIUM CONTAINING ALLOYS

Gunnar Grunbaum; John Erik Wallen; John Kjell Gustafsson, and Gustaf Widmark, all of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Dec. 21, 1973, Ser. No. 427,094

Claims priority, application Sweden, Dec. 29, 1972, 17146/72

Int. Cl. C21c *7/04*; C22c *39/14*

U.S. Cl. 75—58 **6 Claims**

1. Method of producing a chromium-containing alloy having very low contents of nitrogen and carbon not amounting, in toto, to more than 0.01 percent by weight, which comprises melting a charge containing at least 1 percent by weight of carbon and consisting essentially of a chromium-containing initial material together with a base metal and desired alloying elements;

adding to the melt a nitridable member of the group consisting of aluminum and aluminum alloys, in an amount corresponding to at least 3 percent by weight of said melt, thereby converting nitrogen to aluminum nitride in the form of a constitutent of the resulting slag; and

thereafter refining the molten charge by oxidizing caroon and residual aluminum and removing slag containing aluminum nitride and aluminum oxide.

3,885,959
COMPOSITE METAL BODIES

Frank Arthur Badia, Ringwood, N.J., and Pradeep Kumar Rohatgi, Bethlehem, Pa., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 715,937, March 25, 1968, abandoned, which is a continuation-in-part of Ser. No. 644,429, May 25, 1967, abandoned, which is a continuation-n-part of Ser. No. 585,097, Oct. 7, 1966, abandoned. This application May 10, 1971, Ser. No. 141,991

Int. Cl. C22c *21/00*

U.S. Cl. 75—138 **21 Claims**

1. A new and improved cast aluminum base alloy, said alloy containing at least about 0.6 percent by weight of uncombined graphitic carbon in the form of graphite particles of at least about 5 but not greater than about 2,000 microns average cross-section size, about 5 to 25% silicon, up to about 25% tin, up to about 15% copper, up to about 15% magnesium, up to about 20% zinc, up to about 10% nickel with the proviso that when the nickel content is at least 4% the total percentage of nickel plus silicon does not exceed 20%, up to about 8% cobalt, up to about 5% manganese, up to about 1.5% iron, up to about 1% chromium, and the balance essentially aluminum, said graphite particles having been introduced into a molten bath of the aluminum-base alloy in the form of metal coated particles, the metal coating being effective to have imparted compositional stability to the base alloy in the molten condition.

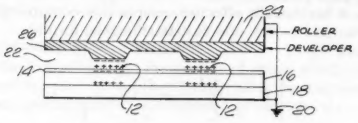
3,885,960
METHOD OF DEVELOPMENT OF LIQUID ELECTROSTATIC IMAGES USING AN HYDROPHOBIC BARRIER LIQUID

Terry G. Anderson, Pasadena, Calif., assignor to Bell & Howell Company, Pasadena, Calif.

Filed Dec. 11, 1972, Ser. No. 314,212

Int. Cl. G03g *13/10*

U.S. Cl. 96—1 LY **18 Claims**



1. A method of development of electrostatic images, which method comprises:

depositing a layer of hydrophobic barrier liquid on a surface bearing a latent electrostatic image, said barrier liquid wetting said surface;

depositing a layer of aqueous developer liquid, containing a major proportion by weight of water and a minor proportion by weight of a surface tension-lowering agent, on said layer of barrier liquid, said liquid developer being immiscible with said barrier liquid and bearing a coloring agent dissolved or dispersed therein having no or low solubility in said barrier liquid;

holding said barrier liquid and developer liquid on said surface until said developer liquid displaces said barrier liquid from the areas of said surface bearing said image and wets said surface areas so as to form a visible image; and

thereafter fixing said visible image on a receptor sheet.

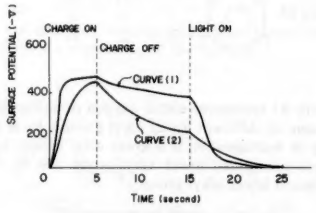
3,885,961
POLYMERIC BINDER MATERIAL FOR USE IN A PHOTOCONDUCTIVE LAYER EMPLOYED IN ELECTROPHOTOGRAPHY

Tadasu Kimura, Tokyo; Tomozo Uchiyama, and Thuneo Kochi, both of Ohtake, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Aug. 1, 1972, Ser. No. 277,061

Int. Cl. G03g *5/08*

U.S. Cl. 96—1.5 **4 Claims**



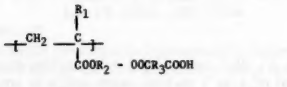
1. A photosensitive material for electrophotography comprising an electrically conductive substrate material and a photoconductive layer provided thereon, characterized in that said photoconductive layer is formed from a resin composition consisting essentially of:

a. a photoconductive powder, and

b. a binder which comprises a mixture of

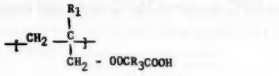
1. polymer [A] having a glass transition temperature of −20° to 100°C, and a mean molecular weight MW_1, of $500 \leq MS \leq 5000$; and containing a structural unit represented by the following formulas [I] or [II], the $-OOCR_2COOH$ content in said formulas being 0.5–90

percent by weight, based on the weight of polymer [A]:



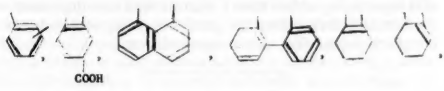
[I]

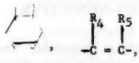
or



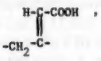
[II]

wherein R_1 is hydrogen or methyl, R_2 is an alkylene radical of 2–8 carbon atoms, a polyethylene glycol residue having 10 or less recurring units or a polypropylene glycol residue having 10 or less recurring units, and R_3 is



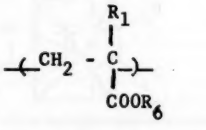


wherein R_4 and R_5 are hydrogen or alkyl of 1–4 carbon atoms, or



and in a major amount

2. polymer [B] having a glass transition temperature of 0 to 60°C and a mean molecular weight MW_2 of 5000 MW_2 50,000 and greater than that of MW_1; and containing 60 percent by weight or less of structural units represented by said formulas [I] or [II] and at least 30 percent by weight of the structural units being represented by the following formula [III]:



[III]

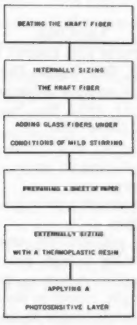
where R_1 is the same as defined above and R_6 is straight or branched chain alkyl of 1–12 carbon atoms, cycloalkyl or benzyl

said binder containing 0.5–60 percent by weight of —$OOCR_3COOH$.

3,885,962
PHOTOGRAPHIC AND ELECTROPHOTOGRAPHIC MEMBERS WITH GLASS FIBER CONTAINING PAPER SUBSTRATES

Robert H. MacClaren, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 857,430, Sept. 12, 1969, Pat. No. 3,773,513. This application July 16, 1973, Ser. No. 379,683
Int. Cl. G03g *5/00;* **G03c** *1/86*
U.S. Cl. 96—1.8 **7 Claims**


BEATING THE KRAFT FIBER
INTERNALLY SIZING THE KRAFT FIBER
ADDING GLASS FIBERS UNDER CONDITIONS OF MILD STIRRING
PREPARING A SHEET OF PAPER
EXTERNALLY SIZING WITH A THERMOPLASTIC RESIN
APPLYING A PHOTOSENSITIVE LAYER

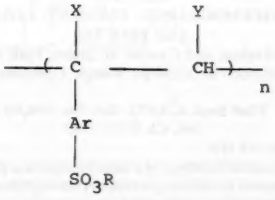
1. A photosensitive member comprising:
a. a cellulose fiber substrate having a thermoplastic resin surface size and containing from about 50 to 80 percent by weight of glass fibers having lengths ranging from 1 to 10 millimeters and diameters ranging from 0.09 to 3 microns, and
b. at least one layer of a photosensitive material contained on the surface of said substrate.

3,885,963
LIGHT ACTIVATING IMAGING PROCESS

Alan R. Monahan, East Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 245,276, April 18, 1972, Pat. No. 3,834,906, which is a continuation-in-part of Ser. No. 816,104, April 14, 1969, abandoned. This application May 29, 1973, Ser. No. 364,991
Int. Cl. G03t *7/02*
U.S. Cl. 96—33 **1 Claim**

1. A light imaging process comprising coating a layer of alkyl esters of polyvinylaryl sulfonic acids, said esters satisfying the formula:



wherein R may be any straight or branched chain alkyl group including halogen substituted groups up to and including ten carbon atoms;
wherein *n* is an integer having a value of from 10 –>∞;

X and/or Y are hydrogen, halogen, alkyl or halogen substituted alkyl groups;

wherein Ar may be any polynuclear aromatic fused ring hydrocarbon up to and including five benzene rings.

on the surface of a support substrate and exposing said layer to actinic radiation corresponding to a predetermined pattern to produce a translucent image.

3,885,964

PHOTOIMAGING PROCESS USING NITROSO DIMER

George Raymond Nacci, Wilmington, Del., assignor to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed May 31, 1974, Ser. No. 476,134
Int. Cl. G03c *5/00, 5/03, 5/10*
U.S. Cl. 96—35.1 **12 Claims**

1. A method for producing an image on a substrate by the process which comprises

a. coating the substrate with a photopolymerizable composition which comprises

1. a nongaseous, ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chain addition propagation,
2. 3 to 95% by weight, based on the total composition, of an organic polymeric binder having a molecular weight of at least 4000,
3. 1 to 10% by weight, based on the total composition, of an organic, radiation-sensitive, free-radical generating system, and
4. 0.1 to 2% by weight, based on the total composition, of a thermally dissociable nitroso dimer having a dissociation constant of 10^{-2} to 10^{-10} and a dissociation half-life of at leat 30 seconds in solution at 25°C., the weight ratio of nitroso dimer to free-radical generating system being less than 2 to 1,

b. exposing the photopolymerizable coating to radiation having wavelengths essentially limited to 3400 to 8000A through an image-bearing transparency at a temperature of 50°–70°C.,

c. allowing the coating to cool to a temperature below 45°C. to reduce the concentration of nitroso monomer,

d. reexposing a greater portion of the coating, including the portion struck by radiation during the first exposure, to radiation having wavelengths essentially limited to 3400 to 8000A at a temperature below 45°C., and

e. developing the resulting image.

3,885,965

PHOTOTHERMOGRAPHIC ELEMENT, COMPOSITION AND PROCESS

Donald J. Hughes, and Cynthia G. Jones, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

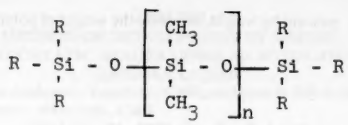
Filed Sept. 4, 1973, Ser. No. 394,003
Int. Cl. G03c *1/02*
U.S. Cl. 96—48 HD **8 Claims**

7. A method of developing a latent image in a photothermographic element comprising a support having thereon a photothermographic layer comprising

a. photosensitive silver salt,

b. a polymeric, hydrophobic binder and

c. about 0.001 to about 1.0 percent by weight of said layer of a poly(dimethylsiloxane) having units represented by the formula:



wherein R is an alkyl radical of 1 to 3 carbon atoms or an alkoxy radical of 1 to 2 carbon atoms and *n* is any number from 0 to 2000, comprising heating said element within the range of about 80°C. to about 250°C. until said image is developed.

3,885,966

PHOTOSENSITIVE SILVER HALIDE LAYERS AND PROCESS

Robert F. Gracia, Scituate; Richard A. Laughrey, Woburn, and Paul F. Tuohey, Quincy, all of Mass., assignors to Itek Corp., Lexington, Mass.

Division of Ser. No. 45,927, June 12, 1970, Pat. No. 3,775,114. This application May 7, 1973, Ser. No. 357,999
Claims priority, application United Kingdom, July 14, 1969, 35290/69; July 14, 1969, 35289/69; July 14, 1969, 35288/69
Int. Cl. G03c *5/26, 1/76, 1/78*
U.S. Cl. 96—50 R **18 Claims**

1. In a photosensitive medium, the improvement wherein the photosensitive layer comprises silver halide and a binder, said layer being of less than 1 micron thickness deposited on a substrate selected from the group consisting of a hydrophobic photographic film and a paper substrate.

3,885,967

THERMALLY DEVELOPABLE LIGHT-SENSITIVE ELEMENT

Kenji Sashihara; Takao Masuda; Yasuhiro Noguchi, and Tadao Shishido, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 7, 1974, Ser. No. 467,763
Claims priority, application Japan, May 7, 1973, 48-50427
Int. Cl. G03c *1/02, 1/06*
U.S. Cl. 96—67 **12 Claims**

1. A photosensitive material for a thermally developable lightsensitive element which comprises:

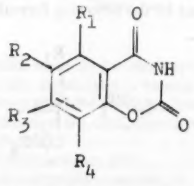
a. s silver salt component comprising silver laurate or silver caprate,

b. a catalytic amount of a photosensitive silver halide component comprising a photosensitive silver halide, or a compound which reacts with silver laurate or silver caprate to form a photosensitive silver halide,

c. a reducing agent,

d. a binder, and

e. a toning agent comprising a compound represented by the formula:



wherein R_1, R_2, R_3, and R_4 each represents a hydrogen atom, an alkyl group, an alkoxy group, an aryl group, an acylamido group, a halogen atom, a hydroxyl group or nitro group.

3,885,968
THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Shinpei Ikenoue, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 30, 1974, Ser. No. 474,635
Int. Cl. G03c 1/02, 1/34
U.S. Cl. 96—67 **12 Claims**

1. A thermally developable light-sensitive material comprising a support having thereon at least one layer containing: (a) silver laurate or silver caprate; (b) a catalytic amount of a light-sensitive silver halide or a compound capable of forming a light-sensitive silver halide by the reaction thereof with said organic silver salt (a); (c) a reducing agent; (d) a binder; and (e) lithium laurate.

3,885,969
PHOTOGRAPHIC MATERIALS WHICH CONTAIN BARRIER LAYERS AND ANTIHALATION LAYERS

Peter Kruck, Cologne, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed June 4, 1973, Ser. No. 366,286
Claims priority, application Germany, June 8, 1972, 2227889
Int. Cl. G03c 1/84
U.S. Cl. 96—84 R **10 Claims**

1. A photographic material comprising a support having a pair of converse major surfaces and containing at least one plasticizer, the obverse of said converse surfaces carrying a light-sensitive emulsion layer, the reverse of said converse surfaces carrying a barrier layer comprising a polymer which contains at least one salt of an acetal of vinylalcohol and an aldehyde sulphonic acid, on said barrier layer an antihalation layer, a binder in said antihalation layer for providing a solubility corresponding to complete solubility in a developer of the following composition:

p-aminophenol	50 g
potassium sulfite	500 g
potassium hydroxide	50 g
potassium bromide	20 g
ethylene diaminotetraacetic acid	10 g
Water up to 1000 ml	

having one part by volume of developer to 50 parts by volume of water with 15° DH whereby the antihalation layer may be removed by dissolution during development.

3,885,970
PHOTOGRAPHIC SILVER HALIDE EMULSION WITH SILVER HALIDE GRAINS HAVING ONE TWINNING PLANE

Junji Miyahara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 13, 1974, Ser. No. 469,136
Claims priority, application Japan, May 11, 1973, 48-52390
Int. Cl. G03c 1/02, 1/06, 1/48, 1/40, 1/72, 1/38, 1/34
U.S. Cl. 96—94 R **7 Claims**

1. A photographic silver halide emulsion comprising a dispersing medium containing silver halide crystals of which a proportion of more than 30 percent by weight of the silver halide crystals have only one twinning plane in each crystal and of which the boundary planes with the dispersing medium comprise a (100) plane, a (111) plane or mixed (100) and (111) planes to the total silver halide crystals.

3,885,971
CONTACT SCREEN AND METHOD FOR NONLINEAR TRANSFORMATIONS AND FILTERING IN COHERENT OPTICAL SYSTEMS

Hisatoyo Kato, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1973, Ser. No. 384,538
Int. Cl. G03f 5/00
U.S. Cl. 96—116 **14 Claims**

1. A nonlinear halftone contact screen useful for realizing nonlinear transformations in coherent optical processing systems, said screen being operative in said system to control the amplitude transmittance t_A such that it is proportional to the specific nonlinear function F of exposure E within the exposure range E_1 E E_2, said nonlinear function being expressed as:

$t_A = F(E)$, where E is the normalized exposure in the range 1 E Em, $E = E/E_1$ and $Em = E_2/E_1$

the amplitude transmittance t_A and the fractional area A of a halftone dot being expressed as:

$$t_A^2 = T_W - A(T_W - T_B),$$

where T_W is the intensity transmittance of the transprrent area of a halftone transparency and T_B is the intensity transmittance of the opaque area of a halftone transparency, said screen having an array of dots each of which has a light transmittance profile $D_s(A)$ being expressed as:

$$D_s(A) = \log E$$

which is the density of the halftone screen dot at the edge of the area A.

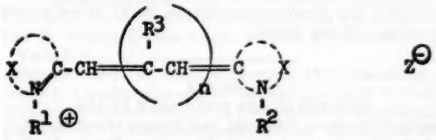
6. A method of making a nonlinear halftone contact screen as recited in claim 5 wherein the single dot produced in said fabricating step is magnified in size when compared with the size of a dot in said periodic dot structure, said method further comprising the step of photographically reducing the size of the fabricated dot prior to the step of photographically reproducing the dot.

3,885,972
SUPERSENSITIZED DIRECT POSITIVE PHOTOGRAPHIC SILVER SALT EMULSIONS

Erik Moisar, Cologne, and Oskar Riester, Leverkusen, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Dec. 18, 1972, Ser. No. 316,048
Claims priority, application Germany, Dec. 22, 1971, 2163676
Int. Cl. G03c 1/10, 1/24, 1/26
U.S. Cl. 96—126 **4 Claims**

1. A photographic direct-positive material containing at least one direct-positive fogged silver halide emulsion layer, the silver halide grains of said emulsion layer contain electron traps, the said emulsion containing a super-sensitizing combination comprising a symmetrical or unsymmetrical cyanine dye of the following formula:



in which

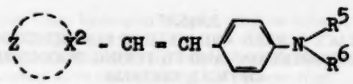
X = the ring members required for completing a benzooxazole, benzothiazole, benzoselenazole or quinoline ring;

R^1 or R^2 = a saturated or olefinically unsaturated aliphatic group;

R^3 = alkyl with up to 3 carbon atoms, cycloalkyl or phenyl;

$n = 0$ or 1;

Z^- = any inorganic or organic anion; and a super-sensitizing styryl compound of the following formula:



in which

R^5 and R^6 = hydrogen, a saturated or unsaturated aliphatic group or a cycloaliphatic group;

X^2 and Z = the ring members required for completing a heterocyclic ring selected from the class consisting of thiazole, benzothiazole, naphthothiazole, selenazole, benzoselenazole, naphthoselenazole, oxazole, benzoxazole, naphthoxazole, 3,3-dialkylindolenine, 2-pyrridine, 4-pyrridine, 2-quinoline, 4-quinoline, isoquinoline, diazoline, oxazolone, pyrroline, tetrahydropyridine, thiadiazole, oxadiazole, pyrimidine, triazine, benzothiazine, benzotriazole, pyrimidone, thiopyrimidone, and benzimidazole.

3,885,973

Li_2O-ZnO-P_2O_5-GLASS

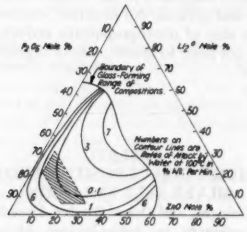
Neil Hunter Ray, and John Nicolas Clayton Laycock, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, Millbank, London, England

Filed May 29, 1973, Ser. No. 364,637

Claims priority, application United Kingdom, June 8, 1972, 26807/72

Int. Cl. C03c 3/16, 3/30

U.S. Cl. 106—47 R **7 Claims**


Boundary of Glass-Forming Range of Compositions
Numbers on Contour Lines are Rates of Attack by Water at 100°C in % Wt. Per Min.
ZnO Mole %

1. An inorganic oxide glass composition consisting essentially of

58 to 76 mole % P_2O_5;

5 to 30 mole % ZnO;

5 to 25 mole % Li_2O; and

0 to 10 mole % of one or more alkaline earth metal oxides, and wherein the total of all the above components is at least 99 mole % of the total composition, apart from any water which may be present in the glass in amounts up to 5% by weight of the total composition, the glass having a transformation temperature of not greater than 300°C. and a rate of solution in water at 100°C. of not greater than 1.3% per minute.

3,885,974

SEALING GLASS FOR LASER GLASS

Yoshiyuki Asahara, Kawasaki, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Limited, Tokyo, Japan

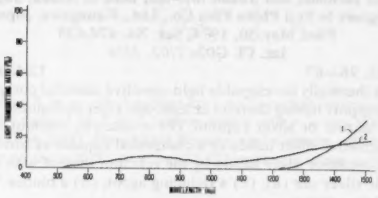
Filed July 30, 1973, Ser. No. 383,743

Claims priority, application Japan, Oct. 9, 1972, 47-101367

Int. Cl. C03c 3/12, 3/16, 3/30

U.S. Cl. 106—47 Q **3 Claims**

1. A sealing glass for laser glass produced by adding V_2O_5 0–18 mol.%, Fe_2O_3 0–18 mol.%, (V_2O_5+Fe_2O_3 5–18 mol.%), Co_2O_3 0-6 mol.% and NiO 0–7 mol.% to a balancing amount of a base glass consisting of P_2O_5 70–30 mol.%, B_2O_3 0–15 mol.%, Al_2O_3 0–5 mol.%, (P_2O_5+B_2O_3+Al_2O_3 30–70 mol.%), PbO 0–55 mol.%, Tl_2O 0–55 mol.%, ZnO 5–50 mol.%,



($PbO+Tl_2O$ 20–55 mol.%; $PbO+Tl_2O$+ZnO 25–60 mol.%) and BaO 0–10 mol.%.

3,885,975

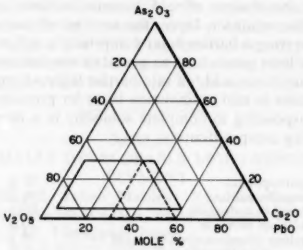
LOW MELTING VANADATE GLASSES

Joseph W. Malmendier, and Joseph E. Sojka, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 247,118, April 24, 1972, Pat. No. 3,837,866. This application May 9, 1974, Ser. No. 468,499

Int. Cl. C03c 3/12

U.S. Cl. 106—47 R **6 Claims**



1. A low melting vanadate glass having a composition, in weight percent as calculated on the oxide basis in terms of Cs_2O, PbO, As_2O_3, and V_2O_5, consisting essentially of 5–60 percent Cs_2O + PbO, wherein both Cs_2O and PbO are present in amounts greater than incidental impurity levels, 5–45% As_2O_3, and 25–85% V_2O_5, said glass being essentially free from SiO_2, P_2O_5, Al_2O_3, Li_2O, Na_2O, and K_2O.

3,885,976

SOLARIZATION RESISTANT GLASS CONTAINING YTTERBIUM OXIDE

Elias Snitzer, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 55,265, July 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 820,011, April 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 523,565, Jan. 28, 1966, abandoned. This application May 8, 1972, Ser. No. 251,730

Int. Cl. C03c 3/04, 3/30

U.S. Cl. 106—52 **4 Claims**

4. In a solarization resistant glass composition selected from a group consisting of silicates, phosphates, borates and germanates containing an antisolarization agent, the improvement wherein said antisolarization agent consists of ytterbium oxide in the amount of 0.10 to 35 weight percent of said glass composition and wherein said composition contains as an ingredient to quench the fluorescence of Yb^{3+} ions in the region of 1 micron, an oxide of a transition metal ion in the amount of 0.01 to 5 weight percent of said glass composition selected from the group consisting of Ni^{2+}, Co^{2+}, Cu^{2+}, Fe^{2+} and V^{3+}, whereby the glass composition has non-solarization and non-

fluorescent properties in the visible and near infra-red regions of the optical wavelength spectrum.

3,885,977

ANISOTROPIC CORDIERITE MONOLITH

Irwin M. Lachman, and Ronald M. Lewis, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 5, 1973, Ser. No. 412,862

Int. Cl. C04b *35/18, 35/20*

U.S. Cl. 106—62 **29 Claims**

1. An anisotropic, polycrystalline sintered ceramic product having cordierite as its primary phase and consisting essentially on an analytical oxide basis of 11.5–16.5% RO, 33–41% Al_2O_3 and 46.6–53% SiO_2 and having a coefficient of thermal expansion in at least one direction of less than 11.0×10^{-7} in./in./°C. over the range of 25°–1000°C., and wherein RO consists essentially of one member selected from the group consisting of NiO, CoO, FeO, MnO and TiO_2,

the NiO when selected being less than 25% by weight of the RO,

the CoO when selected being less than 15% by weight of the RO,

the FeO when selected being less than 40% by weight of the RO,

the MnO when selected being less than 98% by weight of the RO,

the TiO_2 when selected being less than 15% by weight of the RO,

and the balance of the RO being substantially all MgO.

3,885,978

INORGANIC COATING COMPOSITION

Kazuo Doi, Osaka; Jun Nakajima, Kyoto; Masahiko Shodai, Takatsuki; Junichi Uchimura, Nishinomiya; Takeaki Wada, and Zenzaburo Shibata, both of Osaka, all of Japan, assignors to Matsushita Electric Works, Limited, Kadoma, Japan

Continuation-in-part of Ser. No. 823,979, May 12, 1969, abandoned. This application Sept. 12, 1973, Ser. No. 396,367

Claims priority, application Japan, May 31, 1968, 43-37247; May 31, 1968, 43-37248; May 31, 1968, 43-37249; May 31, 1968, 43-37250

Int. Cl. C04b *19/00*

U.S. Cl. 106—85 **1 Claim**

1. An inorganic coating composition which comprises (1) a spinel type double oxide of (a) at least one metal selected from the group consisting of Zn, Mg, Ca and Ba and (b) at least one metal selected from the group consisting of Ti, Fe, Sn, Co, Cr, Al and Mn, (2) a binder selected from the group consisting of (a) condensed phosphoric acid metal salts, said metal being Al or a mixture of Al and one or more of Mg, Ca, Cu, Fe, Mn and Zn and (b) phosphates of the formula

$$MO{\cdot}xP_2O_5{\cdot}yH_2O$$

wherein M is Al or a mixture of Al and one or more of Mg, Ca, Cu, Fe, Mn and Zn, the atomic ratio M/P being 0.25 – 1.0, and each of x and y is a real number, and (3) a curing agent selected from the group consisting of $Ca(OH)_2$, alumina cement, portland cement, $CaCl_2$ and $MgCl_2$, the amount of the double oxide being 15 – 70 parts by weight per 100 parts by weight of the phosphate binder and the amount of the curing agent being 1 – 15 parts by weight per 100 parts by weight of the phosphate binder.

3,885,979

CEMENT PRODUCTS

Arturo Rio; Marcello Cerrone, and Alberto Saini, all of Colleferro, Italy, assignors to Societa' Italiana per la Produzione di Calci e Cementi di Segni, Rome, Italy

Filed Feb. 11, 1974, Ser. No. 441,661

Claims priority, application Italy, Aug. 6, 1970, 52712A/70; Aug. 8, 1970, 52749A/70

Int. Cl. C04b *7/02*

U.S. Cl. 106—89 **1 Claim**

1. A process for manufacturing cement articles having very high mechanical strength, comprising

a. forming articles of the desired shape from a member selected from the group consisting of mortar or concrete prepared from water and portland cement having a high silicic modulus, pozzolana cement, and a mixture consisting of 50 to 90% by weight of portland cement and 50 to 10% by weight of reactive siliceous material;

b. pre-aging the articles at room temperature;

c. steam curing the articles in an autoclave at a temperature from 150° to 250°C. for 1 to 6 hours; and

d. maintaining the steam cured articles in an anhydrous environment at a temperature from 120° to 350°C. for 1 to 12 hours.

3,885,980

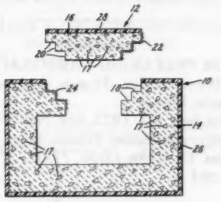
FIRE RESISTANT COMPOSITION

Michael J. Noone, Wayne, Pa., assignor to General Electric Company, Fairfield, Conn.

Filed Apr. 12, 1973, Ser. No. 350,538

Int. Cl. C04b *11/00*

U.S. Cl. 106—109 **2 Claims**



1. A composition of matter protective against temperature up to 1400°C. comprising:

a. gypsum;

b. discrete particulate inclusions therein of magnesium sulphate heptahydrate $M_gSO_4.7H_2O$.

3,885,981

STARCH COMPOSITIONS CONTAINING SALTS OF CERTAIN MONOALKYL FUMARATES AND MALEATES

Paul D. Thomas, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 805,020, March 6, 1969, abandoned, which is a continuation of Ser. Nos. 446,429, April 7, 1965, abandoned, and Ser. No. 661,221, Aug. 17, 1967, abandoned, said Ser. No. , Continuation-in-part of Ser. No. 391,080, is a continuation-in-part of Ser. No. 306,277, Sept. 3, 1963, abandoned. This application July 25, 1973, Ser. No. 382,395

Int. Cl. C08b *25/02, 27/26*

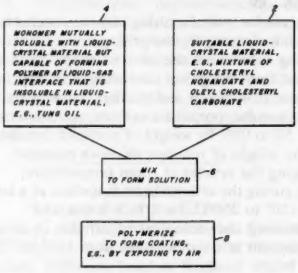
U.S. Cl. 106—210 **4 Claims**

1. A composition comprising starch and from about 0.1% to about 4% by weight based on said starch of a substance selected from the group consisting of the sodium, potassium, calcium and magnesiun salts of monoalkyl fumarates and maleates containing from about 14 to 18 carbon atoms in the alkyl group.

3,885,982
LIQUID CRYSTAL COATING

James L. Fergason, Kent, Ohio, assignor to G. J. Roush, Seattle, Wash.

Continuation of Ser. No. 737,880, June 18, 1968, abandoned. This application Aug. 17, 1970, Ser. No. 64,602
Int. Cl. C08h 9/00
U.S. Cl. 106—252 4 Claims

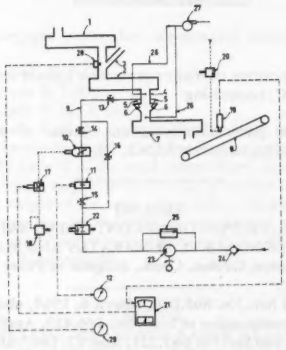

4
MONOMER MUTUALLY SOLUBLE WITH LIQUID-CRYSTAL MATERIAL BUT CAPABLE OF FORMING POLYMER AT LIQUID-GAS INTERFACE THAT IS INSOLUBLE IN LIQUID-CRYSTAL MATERIAL, E.G., TUNG OIL
2
SUITABLE LIQUID-CRYSTAL MATERIAL, E.G., MIXTURE OF CHOLESTERYL NONANOATE AND OLEYL CHOLESTERYL CARBONATE
MIX TO FORM SOLUTION
6
POLYMERIZE TO FORM COATING, E.G., BY EXPOSING TO AIR
8

1. As a composition of matter, a mixture consisting essentially of 10 to 80 weight percent of a liquid crystal and 90 to 20 weight percent of a monomer drying oil miscible with the liquid crystal but capable of forming at a liquid-gas interface over the liquid crystal an essentially transparent hard surface polymer coating insoluble in the liquid crystal, the liquid crystal having the property of selective light scattering and being selected from the group consisting of cholesteric-phase liquid crystals and nematic-phase liquid crystals.

3,885,983
METHOD FOR PREPARING CARBONACEOUS PASTES

Roger Bulit, Wambrechies, France, assignor to Aluminum Pechiney, Paris, France

Filed Sept. 27, 1972, Ser. No. 292,518
Claims priority, application France, Sept. 28, 1971, 34750
Int. Cl. C08h 13/00, 17/02, 17/08
U.S. Cl. 106—281 5 Claims



1. A method of preparing, in particulate form, a carbonaceous paste consisting essentially of carbon in admixture with a carbonaceous binder capable of being fluidized by heat, for use of the carbonaceous paste particularly in the manufacture of electrodes, comprising the steps of heating the carbonaceous paste to a pasty state at a temperature considerably above 100°C, introducing said heated carbonaceous paste into a closed space and spraying water in atomized form into contact with the carbonaceous material as it passes through the enclosed space whereby the droplets of water vaporize upon contact with the heated carbonaceous material to break up the carbonaceous material into small and relatively dry fragments while simultaneously cooling the fragments of carbonaceous material, and collecting the cooled fragments of carbonaceous material for removal from the enclosed space.

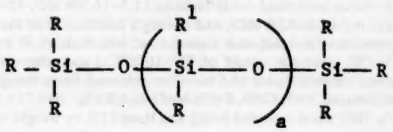
3,885,984
METHYL ALKYL SILICONE THERMOCONDUCTING COMPOSITIONS

John H. Wright, Elnora, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,815
Int. Cl. C09k 3/02
U.S. Cl. 106—287 SB 13 Claims

1. A composition having high thermoconductance comprising:

i. a methyl alkyl polysiloxane having the formula



wherein R is methyl and R^1 is a monovalent hydrocarbon radical having from four to 16 carbon atoms and being free of aliphatic unsaturation, and a has an average value of from 4 to 40; and

ii. a thickener selected from the group consisting of beryllium oxide, zinc oxide, aluminum oxide and silicon oxide, the amount of said thickener in said composition being at least sufficient to provide a penetration of 350 when measured according to ASTM Test Method 217D.

3,885,985
ADDITIVE FOR IMPROVING HYDRAULIC CEMENT COMPOSITIONS

Frank G. Serafin, Peabody; Robert W. Previte, Lawrence, and Robert F. Stierli, Lexington, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 403,963, Oct. 5, 1973. This application Apr. 1, 1974, Ser. No. 456,715
Int. Cl. C04b 13/24
U.S. Cl. 106—315 10 Claims

1. An additive for hydraulic cement compositions which additive is readily dispersible in water and comprises an oil-in-water emulsion in which the solids portion is comprised of a major proportion of a water-insoluble, water-repelling acid component selected from the group consisting of fatty acids, rosin acids and mixtures thereof, from about 3 to about 30 percent by weight of a set-retarding component for said hydraulic cement, and at least about 0.5 percent by weight of an emulsifier formed by reacting said acid component with a base capable of forming a salt thereof, which salt will maintain a stable emulsion.

3,885,986
METHOD FOR THE CHEMICAL TREATMENT, LIKE CLEANING OR PICKLING, OF INSTALLATIONS WITH AT LEAST ONE STEAM GENERATOR

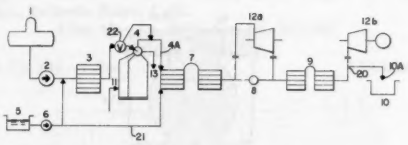
Victor Dahm, Winterthur, Switzerland, assignor to Beratherm AG, Zurich, Switzerland

Filed Oct. 19, 1973, Ser. No. 408,199
Int. Cl. B08b 9/06; C23g 1/02
U.S. Cl. 134—3 9 Claims

1. A method for chemically treating, including cleaning, pickling and the like, of installations of the type having at least one steam generator, wherein the steam generator is of the natural circulation kind having substantially vertically di-

rected circulation conduits and operable on the thermo-syphon principle during steam generation, said installation being further of the type having a forced through-flow system to which the steam generator is connectible at an intermediate point wherein a first part of said through-flow system is preceded by a feed-water pump and is located ahead of said steam generator in series with the remaining part of said through-flow system which follows said steam generator, said through-flow system parts including at least one parallel pipe system, said method comprising the steps of:

first introducing a treatment liquid into said part of said installation in front of said steam generator and urging said treatment liquid through said part with said pump and filling said steam generator with said treatment liquid from said first part;



injecting a gas into the treatment liquid in the lower zone of the steam generator and thereby reducing the specific weight of such treatment liquid thereat to effect a self-circulation of the treatment liquid within the steam generator;

subsequent to complete filling of the steam generator, forcing a flow with said pump of treatment liquid from the steam generator through the following part of said through flow system;

whereby treatment liquid self-circulates within the steam generator for chemical treatment of the conduits thereof and treatment liquid is forcibly circulated by said pump through the pipe systems of the prior and following parts of the through-flow system.

3,885,987

PROCESS FOR CLEANING AND SANITIZING EAR SETS

Alvin L. Keister, Altadena; Joseph A. Machuszek, Lennox, and Joseph M. Machuszek, Manhattan Beach, all of Calif., assignors to Flight Services Unlimited Inc., El Segundo, Calif.; Flight Services Industries Inc., Bensenville, Ill. and Flight Services Industries Inc., New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,554

Int. Cl. B08b *7/04*

U.S. Cl. 134—6 **8 Claims**

1. A process for cleaning and sanitizing ear sets having ear tips, yoke portions, ear set lines, and ear set line portions, comprising in sequence the steps of:

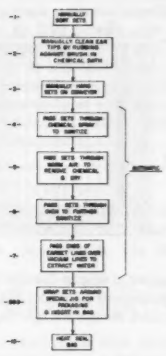
cleaning the ear tips of said sets in a chemical bath,

spraying the ear sets with a liquid chemical spray to sanitize said ear sets,

passing the ear sets through warm air to remove liquid chemical deposited thereon during both the bath cleaning and the spraying and dry the outer portions thereof,

passing the ear sets through an oven heated to a temperature sufficient to effect further sanitization of the ear sets,

passing the ear sets by vacuum and blower lines to extract liquid from inside the ear sets and the ear set lines,



wrapping the ear sets around a jig, and

packaging the ear sets in bags.

3,885,988

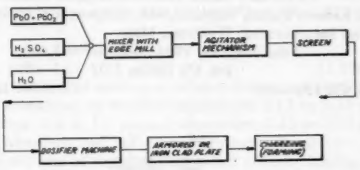
METHOD AND APPARATUS FOR FILLING ADJACENT INSULATING TUBES FORMING THE POSITIVE PLATE OF A LEAD-ACID STORAGE BATTERY

Lorenz Bohle, Gerhardt-Hauptmann-Str. 9, 4415 Westkirchen, Germany

Filed Oct. 4, 1973, Ser. No. 403,540

Int. Cl. H01m *35/26*

U.S. Cl. 136—27 **6 Claims**



1. A method of filling a plurality of adjacent porous tubes of a lead acid storage battery with a paste-like mixture having lead oxide therein comprising the steps of:

adding supplementary water to the paste-like mixture to reduce the viscosity to form a suspension of a reduced viscosity with the water serving as a carrier for the paste, injecting the suspension under pressure into the tubes quickly before the supplementary carrier water separates from the suspension and in sufficient quantity to provide the predetermined volume of paste for the battery tubes, and separating the supplementary water from the paste-like mixture and from the suspension.

3,885,989

THERMAL BATTERY

Donald M. Bush, Tijeras, N. Mex., assignor to The United States Energy Research and Development Administration, Washington, D.C.

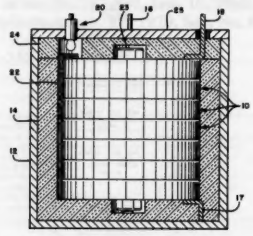
Filed May 30, 1974, Ser. No. 474,549

Int. Cl. H01m *21/14*

U.S. Cl. 136—83 T **2 Claims**

1. A long-life thermal battery comprising a casing; a plurality of electrochemical cells in said casing, each cell including a calcium anode disc, an electrically conductive heat generat-

ing disc, and a normally solid fusible electrolyte disc sandwiched between said anode and heat generating discs, said electrolyte disc including a homogeneous mixture of a calcium



chromate depolarizer, a silicon dioxide binder, and an electrolyte mixture of potassium chloride, lithium chloride, and calcium hydroxide; and means for igniting said heat generating discs.

3,885,990

GALVANIC CELL

Stanley M. Bloom, Waban, and Arnold Hoffman, Brookline, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 9, 1973, Ser. No. 414,511
Int. Cl. H01m *17/00*
U.S. Cl. 136—102 **6 Claims**

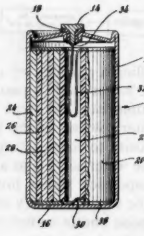
1. A galvanic cell comprising a zinc anode, a cathode and an aqueous electrolyte wherein the electrolyte includes a relatively insoluble mercurous compound which is substantially less soluble than mercuric chloride.

3,885,991

PRIMARY ELECTROCHEMICAL CELL

Joel Roberts Finkel, Wayland, Md., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 28, 1974, Ser. No. 473,460
Int. Cl. H01m *1/02*
U.S. Cl. 136—107 **12 Claims**



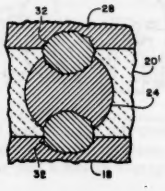
1. A primary cell comprising
an outer case,
an anode,
a cathode,
an electrolyte between and in contact with the anode and the cathode,
the anode, cathode and electrolyte being disposed in the outer case,
a device having essentially unidirectional current flow and low voltage drop in the current flow direction characteristics, being electrically connected to one of the anode and cathode in such a manner that current flow in a recharging direction in the primary cell is prevented so that recharging and reversed polarity operation of the primary cell are precluded, and being disposed within the outer case, and
means for conducting heat away from the device so that the device is protected against heat degradation when high current is passed therethrough.

3,885,992

THERMOCOUPLE AND METHOD OF MAKING SAME

Paul D. Wilcox, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Division of Ser. No. 290,685, Sept. 20, 1972, Pat. No. 3,821,053. This application Jan. 9, 1974, Ser. No. 431,999
Int. Cl. H01v *1/04*
U.S. Cl. 136—212 **7 Claims**



1. A thermoelectric couple comprising an N-type thermoelectric semiconductor material plate, a P-type thermoelectric semiconductor material plate overlying and spaced from said N-type plate with a surface and edges coextensive with and generally parallel to a surface and edges of said N-type plate, an elongated electrically conductive metal member sandwiched between said plates adjacent to and along coextensive edges thereof and thermally joined into interbonded and electrical contact therewith along its length with said coextensive surfaces of said thermoelectric plates to form a thermoelectric junction between said plates along said member length and coextensive edges, and an electrical insulator fused glass layer means for filling space between said coextensive surfaces and around unbonded portions of said conductive member and for bonding said plates and said conductive member together from thermal wetting and cooling of said glass layer means in place simultaneous with thermal joining of said plates and conductive member.

3,885,993

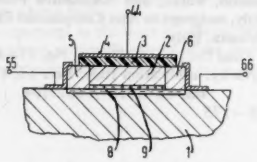
METHOD FOR PRODUCTION OF P-CHANNEL FIELD EFFECT TRANSISTORS AND PRODUCT RESULTING THEREFROM

Jenoe Tihanyi, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 22, 1973, Ser. No. 325,616
Claims priority, application Germany, Feb. 21, 1972, 2208083
Int. Cl. H01l *7/54*
U.S. Cl. 148—1.5 **22 Claims**

1. A process for the production of a p-channel field effect transistor which includes forming a layer of silicon on a spinel substrate, forming p^+-source and drain regions in said silicon layer with a gate region therebetween, forming an insulating layer over said gate region and overlapping a portion of each of said source and drain regions, forming electrodes on said insulating layer and on a portion of each of said source and

drain regions, at least one of the aforesaid steps being carried out at a relatively high temperature, and finally annealing said



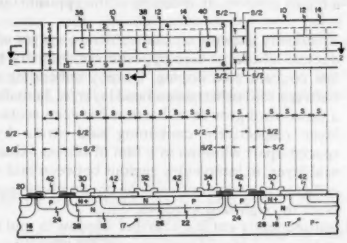
substrate and said silicon layer in a hydrogen atmosphere after all of said high temperature steps have been terminated.

3,885,994

BIPOLAR TRANSISTOR CONSTRUCTION METHOD

Ralph W. Miller, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 25, 1973, Ser. No. 363,995
Int. Cl. H01l 7/54
U.S. Cl. 148—1.5 **12 Claims**



1. A method of fabricating a bipolar transistor in integrated circuit form by a triple deposition process, comprising:

A. forming on a semiconductor substrate surface of first conductivity type a permanent mask from a layer of a first masking material having an inner boundary defining a rectangular opening of predetermined length and width and an outer boundary spaced equidistant from said inner boundary, said inner and outer boundaries defining an annular tolerance region within which must lie edges of subsequent masks of a second material, said first masking material being readily etchable by a first etchant but not by a second etchant;

B. superimposing over said permanent mask a first mask of a second masking material with all four edges thereof lying within said tolerance region so as to mask regions in said substrate surrounding said permanent mask while leaving unmasked the entire area of said substrate lying within said rectangular opening, said second masking material being readily etchable by said second etchant but not by said first etchant;

C. introducing firstly an impurity of second conductivity type through said rectangular opening to form a collector region of second conductivity type within said substrate;

D. superimposing over said permanent mask a second mask of said second masking material with at least one edge thereof crossing said rectangular opening and with the remaining edges thereof lying within said tolerance region so as to partially mask said rectangular opening while leaving unmasked only an area portion of said collector region;

E. introducing secondly an impurity of said first conductivity type into the unmasked area portion of said collector region to form a base region of said first conductivity type within said collector region;

F. superimposing over said permanent mask a third mask of said second masking material with at least three edges thereof crossing said rectangular opening and with the remaining edges thereof lying within said tolerance region so as to partially mask said rectangular opening while leaving unmasked an area portion only of said collector region and an area portion only of said base region; and

G. introducing thirdly an impurity of said second conductivity type into the unmasked area portions of said collector and base regions to form a collector contact region within said collector region and an emitter region within said base region, respectively.

3,885,995

PROCESS FOR CARBURIZING HIGH ALLOY STEELS

Roy J. Cunningham, Turnersville, N.J., and Warren Lieberman, Broomall, Pa., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 10, 1973, Ser. No. 349,715
Int. Cl. C22c 39/14; C23c 11/12
U.S. Cl. 148—6.35 **9 Claims**

1. A process for carburizing a high alloy steel having a carbon content of 0.05 to 0.3 percent and a chromium content of from 2 to 25 percent or greater comprising:

a. heating the steel at a temperature of 1000°F to 1900°F in an oxidizing atmosphere for a period of time of about 30 minutes to 4 hours and sufficient to form a high temperature oxide on the steel surface; and

b. carburizing the steel containing the high temperature oxide in a gas having a carbon potential of about 0.6 to 15 percent at a temperature of about 1550° to 2100°F.

3,885,996

METHOD OF MAKING BALL STUDS

Michio Abe, Kasugai, Japan, assignor to Tokai TRW & Co. Limited, Japan

Continuation-in-part of Ser. No. 210,799, Dec. 22, 1971, abandoned. This application Jan. 28, 1974, Ser. No. 436,955
Claims priority, application Japan, Dec. 28, 1970, 45-119330
Int. Cl. C21d 1/10; C23c 11/12
U.S. Cl. 148—12.1 **11 Claims**

1. The method of making a ball stud from a rod-like blank initially containing as essential ingredients 0.13 to 0.18 percent carbon; 0.9 to 1.2 percent chromium, 0.15 to 0.30 percent molybdenum, and the remainder essentially all iron; cold forming one end of the blank into a ball portion; heating the blank to about 800° C, then supplying carburizing gas to the blank while raising the temperature thereof in the range 890° C to 920° C, cutting off the supply of carburizing gas at the end of a preselected time period, while maintaining the temperature essentiaally constant in the aforesaid range for a time about one-third of said preselected time period, to effect diffusion, quenching the blank, reheating the blank in the range 420° C to 500° C, for about 1-½ hours, quenching the blank, rapidly reheating the ball portion only of the stud by high frequency induction in the range 800° C to 850° C; and immediately quenching the reheated ball portion.

3,885,997

METHOD OF PRODUCING A HOT ROLLED AND AGE HARDENED COLUMBIUM-BEARING STEEL PRODUCT

John H. Bucher, and Daniel F. Jancula, both of Pittsburgh, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed June 13, 1974, Ser. No. 479,007
Int. Cl. C21d 7/14
U.S. Cl. 148—12.3 **6 Claims**

1. A process for producing a killed high strength low alloy steel product having a yield strength in excess of about 80,000 p.s.i. in the hot rolled and age hardened condition, comprising:

a. hot rolling a steel consisting essentially of 0.06 to 0.14 percent carbon, 0.6 to 1.5 percent manganese, 0.07 percent maximum, phosphorous, 0.04 to 0.12 percent columbium, molybdenum in residual quantities, nitrogen in residual quantities, balance iron, at a finishing temperature of from 1550° to 1650°F,

b. collecting said hot rolled steel at a temperature of from 1000° to 1250°F; and

c. age hardening said hot rolled steel by continuously heat treating the steel at a temperature of from 1050° to 1250°F for a time of from 0.5 to 5 minutes so as to increase the yield strength of said hot rolled steel by from about 3,000 to 15,000 p.s.i.

3,885,998

METHOD FOR THE SIMULTANEOUS FORMATION OF SEMICONDUCTOR COMPONENTS WITH INDIVIDUALLY TAILORED ISOLATION REGIONS

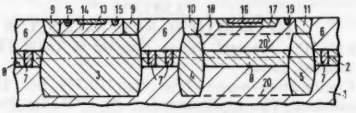
Klaus Reindl, Sherman, Tex., assignor to Siemens Aktiengesellschaft, Munich, Berlin and Erlangen, Germany

Continuation of Ser. No. 95,064, Dec. 4, 1970, abandoned. This application Oct. 16, 1972, Ser. No. 298,013

Claims priority, application Germany, Dec. 5, 1969, 1961247

Int. Cl. H01l 7/36, 27/02

U.S. Cl. 148—175 **2 Claims**



1. Method of producing at least two adjacent semiconductor components each having at least two regions of varying conductance type, the conductance type of the regions of the one semiconductor component being different from those of the other semiconductor component, one region of the one conductance type being surrounded by an insulating zone of the other conductance type electrically insulating the respective semiconductor component, said insulating zone and two regions adjacent said insulating zone forming a parasitic transistor having an electrical amplification lower than the electrical amplification of a normal transistor having a base region that is of said one conductance type; which comprises covering with a masking layer a surface of a semiconductor base member at regions thereof intended for the production of semiconductor components with individually tailored isolation regions; selectively diffusing to produce at least a highly doped annular zone and a second zone into the regions of the semiconductor base member not covered by the masking layer, which zones will form parts of isolating tubs for portions of a subsequently deposited semiconductor layer, removing the masking layer, epitaxially applying semiconductor material of one conductance type to the surface of the semiconductor base member, forming through diffusion and vapor deposition a thin weakly doped zone of the other conductance type at the interface of the epitaxial layer and substrata, said thin zone resulting from the rapid lateral surface diffusion from the highly doped regions, diffusing to produce at least two strongly doped insulating walls so that one insulating wall, the highly doped annular zone and the weakly doped zone define one insulating tub and the other insulating wall and other highly doped zone forms the second different insulating tub.

3,885,999

PLANAR EPITAXIAL PROCESS FOR MAKING LINEAR INTEGRATED CIRCUITS

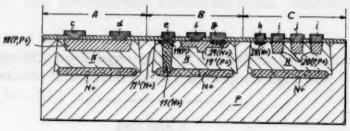
Marzio Fusaroli, Milan, and Alessandro Pecorella, Savona, both of Italy, assignors to Ates Componenti Elettonici S.p.A., Agrate Brianza, Italy

Filed Dec. 12, 1972, Ser. No. 314,475

Claims priority, application Italy, Dec. 15, 1971, 32459/71

Int. Cl. H01l 7/36, 27/04

U.S. Cl. 148—175 **3 Claims**



1. A process for producing integrated circuitry including several juxtaposed units, comprising the steps of:

a. forming, on a substrate of semiconductive silicon of one conductivity type, a plurality of spaced-apart strata with a highly concentrated doping of the opposite conductivity type;

b. epitaxially growing on said substrate a layer of semiconductive silicon of said opposite conductivity type withh less concentrated doping, thereby imbedding said strata between said substrate and said layer; c. thereafter starting a downward growth of barriers between sections of said layer respectively containing said strata by cutting spaced-apart windows in a film of silicon oxide overlying said layer, in intervening regions between said strata, and diffusing impurities of said one conductivity type into said layer through said windows;

d. subsequently cutting a further window in said film above at least one of said sections and diffusing a high concentration of impurities of said opposite conductivity type through said further window to form a web unitary with the underlying stratum simultaneously with the completion of the growth of said barriers into contact with said substrate to isolate said sections from one another;

e. doping selected surface areas of said sections with highly concentrated impurities of said one conductivity type via additional windows formed in said film;

f. thereafter introducing less concentrated impurities of said one conductivity type through said additional windows into enclaves of said sections at said selected surface areas;

g. broadening an additional window formed in step (e) in said one of said sections adjacent said web and thereupon introducing some of said less concentrated impurities of said one conductivity type into said layer through the broadened window to form a stepped enclave;

h. simultaneously letting said highly concentrated and less concentrated impurities of said one conductivity type diffuse to a predetermined depth into said sections to extend said enclaves toward said strata; and

i. applying metallic terminals to said selected surface areas in contact with said enclaves.

3,886,000

METHOD FOR CONTROLLING DIELECTRIC ISOLATION OF A SEMICONDUCTOR DEVICE

Robert L. Bratter, Mahopac, and Arun K. Gaind, Fishkill, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

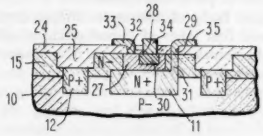
Filed Nov. 5, 1973, Ser. No. 413,095

Int. Cl. H01l 7/36, 27/12

U.S. Cl. 148—175 **19 Claims**

1. A method for fabricating a laterally isolated semiconductor device comprising:

depositing a layer of silicon oxynitride on a surface of a body of silicon;
forming communicating openings in the layer of silicon oxynitride and the body in laterally surrounding relation to a portion of the body;
oxidizing the openings in the layer of silicon oxynitride and the body to form a laterally surrounding dielectric isolation barrier of silicon dioxide in the body while simultaneously converting the layer of silicon oxynitride to a layer of silicon dioxide on the surface of the body;
selecting the index of refraction of silicon oxynitride in conjunction with the thickness of the layer of silicon oxynitride to produce the layer of silicon dioxide of a desired thickness;
and forming an integrated circuit component in the body within the laterally surrounding dielectric isolation barrier.

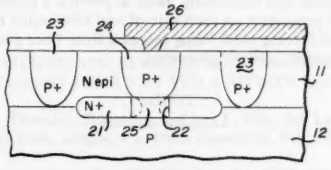


3,886,001

METHOD OF FABRICATING A VERTICAL CHANNEL FET RESISTOR

Robert C. Dobkin, Menlo Park, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 2, 1974, Ser. No. 466,225
Int. Cl. H01l 7/44, 27/02
U.S. Cl. 148—175 **4 Claims**



1. The method for making a channel FET in the substrate of a monolithic integrated circuit device, said substrate being of a first conductivity type, comprising the steps of,
diffusing a buried layer region of a second conductivity type into the device substrate, said buried layer region being band-shaped with an opening therethrough,
growing an epitaxial layer of said second conductivity type on said substrate and over said buried layer,
diffusing an isolation region of said first conductivity type into said epitaxial layer around said buried layer region,
diffusing a channel region of said first conductivity type into said epitaxial layer within said isolation region and down through the opening in said buried layer and into said substrate, said channel region diffusion taking place with said isolation region diffusion, and
forming a surface contact with said channel region.

3,886,002

METHOD OF OBTAINING A FUSED, DOPED CONTACT BETWEEN AN ELECTRODE METAL AND A SEMI-CONDUCTOR

Jury Stepanovich Akimov, ulitsa Kosmonavtov, 4, kv. 30; Auli Alexandrovich Galaev, ulitsa Podbelskogo, 6, korpus 7; Semen Samuilovich Gorelik, ulitsa Valovaya, 4-2/44, kv. 8; Boris Izrailevich Gofman, ulitsa 2 Kabelnaga, 10, kv. 53; Vyacheslav Dmitrievich Ermoshin, ulitsa Ilovaiskaya, 6, kv. 4, all of Moscow; Stanislav Konstaninovich Korovin, ulitsa Zelenaga, 18, Domodedovo, Moskovskoi oblasti; Vladimir Vasilievich Naumov, ulitsa Scherbakovskaya 26/30, kv. 202, Moscow; Konstantin Andreevich Preobrazhentsev, ulitsa Narodnogo Opolcheniya, 16, korpus 3, kv. 8, Moscow; Stanislav Vladislavovich Fronk, Sirenevy bulvar, 36, kv. 154, Moscow; Vadim Lvovich Shvartsman, Krasnokazarmennaya ulitsa 3, kv. 323, Moscow; Vladimir Vasilievich Garshenin, Cherkizovskaya ulitsa, 6 korpus 4, kv. 93, Moscow; Oleg Fedorovich Stakhov, Volgogradsky Prospekt, 158, korpus 2, kv. 6, Moscow; Igor Ivanovich Kruglov, 15 Parkovaya ulitsa, 46 korpus 1, kv. 35, Moscow, and Mark Markovich Samokhvalov, ulitsa Krasikova, 8, korpus 2, kv. 48, Moscow, all of U.S.S.R.

Filed June 20, 1973, Ser. No. 371,844
Int. Cl. H01l 7/46
U.S. Cl. 148—180 **13 Claims**

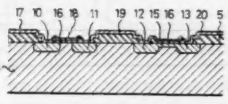
1. A method of producing a fused doped contact between an electrode metal selected from the group consisting of silver, gold and tin and a semi-conductor comprising coating the surface of the semi-conductor essentially with a layer of a transition metal selected from the group consisting of titanium, niobium and zirconium at the reducing temperature of the semi-conductor oxide, coating said layer with a layer of the electrode metal and then with alternating layers of a doping agent and the electrode metal whereby a multilayer structure is formed having a doping agent layers between the electrode metal layers, heating the multilayer structure to a temperature not less than the temperature of the eutectic of "electrode metal-semi-conductor" for a time sufficient to obtain on the surface of the semi-conductor a melt containing the material of the semi-conductor, the electrode metal and the doping agents and to permit diffusion of the doping agent from the melt into the semi-conductor to form a p-n junction, and cooling the semi-conductor to obtain a doped ohmic contact.

3,886,003

METHOD OF MAKING AN INTEGRATED CIRCUIT

Mikio Takagi, Tokyo; Hajime Kamioka, Hoya; Kazufumi Nakayama, and Chiaki Terada, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed Oct. 3, 1972, Ser. No. 294,580
Claims priority, application Japan, Oct. 4, 1971, 46-77715
Int. Cl. H01l 7/44
U.S. Cl. 148—187 **8 Claims**

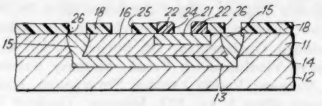


8. The method of manufacturing an integrated semiconductor assembly as claimed in claim 1, including the steps of forming a gate insulator on the surface areas of said substrate intermediate each source and drain and forming a gate electrode on said gate insulators.

3,886,004
METHOD OF MAKING SILICON SEMICONDUCTOR DEVICES UTILIZING ENHANCED THERMAL OXIDATION

Jeffrey Alan Bruchez, Hazel Grove, England, assignor to Ferranti Limited, Hollinwood, Lancashire, England

Filed Feb. 27, 1973, Ser. No. 336,375
Int. Cl. H01l 7/36, 27/04
U.S. Cl. 148—187 8 Claims

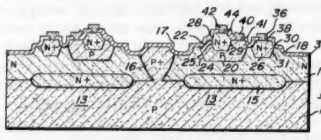


1. An improved method of manufacturing a semiconductor device of the collector-diffusion-isolation type in a semiconductor body comprises the steps of providing a substrate of P conductivity type, forming at least one heavily doped region of N conductivity type adjacent to a selected part of one surface of the substrate, depositing on said surface an extrinsic epitaxial layer of said P conductivity type thereby burying said heavily doped region at the interface of said substrate and said epitaxial layer, forming an isolation barrier of said N conductivity type extending through said epitaxial layer and in contact with the heavily doped buried region, depositing a first silicon oxide layer on the whole of the exposed surface of the epitaxial layer, selectively removing portions of the silicon oxide layer to expose at least one selected region of the epitaxial layer, selectively doping selected regions with phosphorus to form a heavily doped region of said N conductivity type and characterized by the improvement of limiting the deposition of the first silicon oxide layer to form a first oxide layer having thickness less than 3000A thick, subjecting the doped selected regions to steam oxidation to provide a second oxide layer without causing a significant change in the impurity concentration gradients within the semiconductor body wherein the thickness of the silicon oxide layer formed by steam oxidation of the doped regions provides a smoothly graded thickness between the first and the second silicon oxide layers and simultaneously etching apertures through the first and the second silicon oxide layers to expose surface regions of the epitaxial layer.

3,886,005
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Marlo E. Cota, Scottsdale, and John F. Osborne, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed July 13, 1973, Ser. No. 379,046
Int. Cl. H01l 7/34
U.S. Cl. 148—188 5 Claims



1. A method for making a semiconductor device comprising the steps of:

depositing a first layer of a doped oxide of silicon of a second conductivity type on a surface of a body of silicon of a first conductivity type;

forming a first layer of photoresist on said first layer of doped oxide of silicon, said layer of photoresist being patterned to expose the surface of said first layer of doped oxide of silicon;

subjecting said exposed surface to a first etchant and removing said exposed surface of said first layer of doped oxide of silicon thereby exposing said surface of said body of silicon;

subjecting said exposed surface of said body of silicon and said first layer of photoresist to a plasma etchant in a reactor for selectively removing in sequence a predetermined thickness of material from said exposed silicon surface to delineate the region of said body of silicon beneath said first layer of doped oxide of silicon and said first layer of photoresist; and

heating said body of silicon to diffuse doping impurities from said first layer of doped oxide of silicon into said body of silicon to form a region of said second conductivity type therein.

3,886,006
REINFORCED CONSOLIDATED DOUBLE BASE PROPELLANT

Thomas E. Martin, Blountsville, Ala., and John C. Horvath, Radford, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 354,553, April 24, 1973, Pat. No. 3,860,678. This application Oct. 18, 1973, Ser. No. 405,717
Int. Cl. C06c 3/10
U.S. Cl. 149—14 2 Claims

1. A consolidated propellant system comprised of a prior cured double base propellant composition in sheet form that has been softened during a consolidation method whereby said double base propellant composition in sheet form is consolidated with a reinforcing mesh to provide a consolidated propellant system in which said reinforcing mesh has said cured double base propellant composition of uniform thickness on each side thereof, said cured double base propellant composition consisting essentially of in weight percent nitrocellulose from about 48–50, nitroglycerin 38–44, and the balance being trace amounts of 0.1–2.0 of a crosslinking agent, stabilizer, ballistic modifier, catalyst, and procesing aid to enable said cured double base composition to be consolidated with said reinforcing mesh to provide a uniform thickness of propellant on each side of said reinforcing mesh, and said reinforcing mesh being selected from fiber glass, aluminum, copper, and stainless steel.

3,886,007
SOLID PROPELLANT HAVING A FERROCENE CONTAINING POLYESTER FUEL BINDER

Charles S. Combs, Jr., Huntsville, and Charles I. Ashmore, Owens Cross Roads, both of Ala., assignors to Thiokol Corporation, Bristol, Pa.

Division of Ser. No. 730,633, May 20, 1968, abandoned. This application May 9, 1973, Ser. No. 358,568
Int. Cl. C06d 5/06
U.S. Cl. 149—19.2 4 Claims

1. In a solid propellant composition comprising;

an oxidizer selected from the group consisting of ammonium perchlorate, ammonium nitrate and RDX, a metallic fuel and a polymeric binder, the improvement comprising:

said binder comprising a ferrocene polyester consisting essentially of the reaction product of 2-butane-1,4-diol and (ferrocenylmethylthio) succinic acid.

3,886,008
BLASTING COMPOSITION FOR USE UNDER HIGH TEMPERATURE CONDITIONS

Melvin A. Cook, Salt Lake City, Utah, assignor to Ireco Chemicals, Salt Lake City, Utah

Continuation of Ser. No. 876,568, Nov. 13, 1969, abandoned. This application Jan. 21, 1974, Ser. No. 434,765
Int. Cl. C06b *1/04*
U.S. Cl. 149—41 **7 Claims**

1. An explosive blasting composition free of water and stable at temperatures as high as from about 100° to about 200°C consisting essentially of in parts by weight:
30–70 percent of sodium nitrate
0–40 percent of ammonium nitrate
2–20 percent of aluminum
1–10 percent of solid carbonaceous fuel
1–10 percent of an oxygen-containing liquid fuel selected from the group which consists of formamide, dimethylformamide, glycols, and glycol ethers and combinations thereof having a boiling point of at least 140°C.

3,886,009
PROJECTILE CONTAINING PYROTECHNIC COMPOSITION FOR REDUCING BASE DRAG THEREOF

Walter J. Puchalski, Southampton, Pa., assignor to The Government of the United States as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 13, 1973, Ser. No. 424,508
Int. Cl. C06b *1/00*
U.S. Cl. 149—43 **7 Claims**

1. Pyrotechnic composition for reducing drag of a projectile, said projectile having a posterior cavity, said composition disposed in said posterior cavity of said projectile, said composition reducing drag by emitting gases into void rearward said projectile, said void caused by flight of said projectile, said gases substantially filling said void, said pyrotechnic composition comprising by weight 25 to 35 percent magnesium, 47 to 58 percent strontium nitrate, 6 to 12 percent calcium resinate, 1 to 12 percent gelatin.

3,886,010
STABILIZED AND AERATED BLASTING SLURRY CONTAINING THIOUREA AND A NITRITE GASSING AGENT

Gary M. Thornley, Bountiful, and Lex L. Udy, Salt Lake City, both of Utah, assignors to Ireco Chemicals, Salt Lake City, Utah

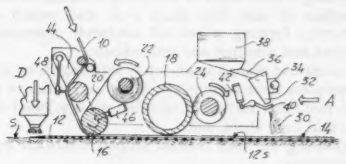
Continuation of Ser. No. 274,236, July 24, 1972, abandoned, which is a continuation of Ser. No. 816,770, April 16, 1968, abandoned. This application July 5, 1973, Ser. No. 376,874
Int. Cl. C06b *1/04*
U.S. Cl. 149—60 **5 Claims**

1. In a blasting composition of the aqueous gel or slurry type employing a decomposable nitrite gassing agent and containing oxidizer salt selected from the group which consists of the ammonium, alkali metal and alkaline earth metal nitrates and the ammonium and alkali metal chlorates and perchlorates, a sufficient amount of fuel of liquid or solid type or both to bring the overall oxygen balance of the composition within the range of +25 to −50 percent, an aqueous fluid phase containing at least part of the oxidizer salt in a concentrated solution, and an organic colloidal galactomannan thickener, the improvement which comprises including thiourea to accelerate decomposition of the nitrite gassing agent while concomitantly stabilizing the thickening effectiveness of the glactomannan thickener.

3,886,011
APPARATUS AND PROCEDURE FOR APPLYING MARKING STRIPES

Ludwig Eigenmann, Vacallo, Canton Ticino, Switzerland

Filed Sept. 14, 1973, Ser. No. 397,245
Int. Cl. B32b *31/12*
U.S. Cl. 156—71 **15 Claims**

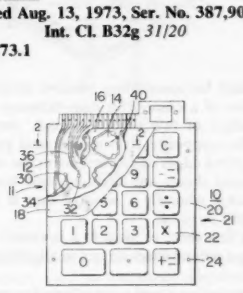


1. In an apparatus for applying traffic lines and markings on a road surface, a combination comprising means for placing a bonding layer on the road surface, said bonding layer having an adhesive upper surface when freshly formed; means including a first and second roller means for applying and pressing a marking tape of a width less than the width of said bonding layer onto said adhesive upper surface while the apparatus travels on the road surface; means for temporarily positioning a protective film intermediate said roller means and said marking tape and adhesive upper surface where said roller means contacts said marking tape and the adjacent uncovered lateral portions of said bonding layer; and means for depositing a layer of powdery material on at least said uncovered lateral portions so as to become embedded in the uncovered portions of said bonding layer to minimize the adhesiveness of said upper surface of the latter.

3,886,012
METHOD OF ASSEMBLY OF KEYBOARD SWITCH BY ULTRASONICS

Laurie F. Slater, Fort Wayne, Ind., assignor to Bowmar Instrument Corporation

Filed Aug. 13, 1973, Ser. No. 387,909
Int. Cl. B32g *31/20*
U.S. Cl. 156—73.1 **12 Claims**



1. The method of assembling a keyboard comprising the steps of:
a. providing an insulative, planar board having opposite surfaces, one of said surfaces having at least one switch contact thereon,
b. providing a first sheet of insulating material having opposite surfaces respectively coated with ultrasonically actuatable adhesive material, said first sheet having an opening therein adapted to receive a switch element,
c. placing one surface of said first sheet on said one surface of said board with said contact exposed to said opening,
d. placing a second sheet of material which will not bond to said adhesive material on the other surface of said first sheet thereby forming a first sandwich comprising said board and said first and second sheets,

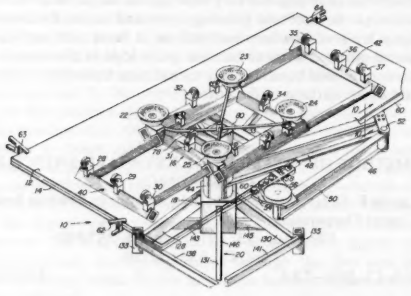
e. placing said first sandwich in ultrasonic welding apparatus and energizing the same thereby to activate said adhesive material on said one surface of said first sheet to bond the same to said one surface of said board,
f. removing said first sandwich from said apparatus and removing said second sheet from said first sheet,
g. placing a switch element in said opening in cooperative relationship with said contact,
h. placing a third sheet of insulating material on said other surface of said first sheet over said switch element thereby forming a second sandwich comprising said board and said first and third sheets,
i. placing said second sandwich in said apparatus and energizing the same thereby to actuate said adhesive material on said other surface of said first sheet to bond the same to said third sheet, and
j. removing the thus bonded second sandwich from said apparatus.

3,886,013

PIVOTED ARM DEVICE FOR ASSEMBLY OF MULTIPLE GLAZED UNITS

George H. Bowser, New Kensington; Renato J. Mazzoni, and John P. Martinec, both of Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1973, Ser. No. 384,541
Int. Cl. B32b *31/04;* **E06b** *3/66*
U.S. Cl. 156—109 **1 Claim**



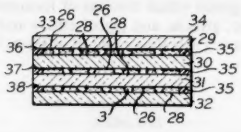
1. A method for assembling window units by inserting a spacer portion of a composite strip between the contiguous peripheral edges of two sheets of glass, pressing a sealant portion of the composite strip against said peripheral edges, folding the lateral edges of said strip over the outside marginal surfaces of said sheets and finishing said lateral edges in a single operation whereby a window unit is assembled in a single pass, the steps of:
securing a first sheet of glass to a horizontal work surface;
securing a second sheet on and in alignment with said first sheet;
pivotally mounting a tool support arm for motion in a plane parallel to the space between said first and second sheets;
pivotally securing to the free end of said pivotally mounted tool support arm an assembly tool comprising spacer wedge means, feed roll and inserter means and finishing means;
inserting said spacer wecge means between said sheets of glass to separate said sheets a distance sufficient to permit insertion of said spacer portion of said composite strip;
advancing said assembly tool around the peripheral edges of said sheets while feeding said composite strip to said feed roll and inserter means and sequentially pressing said spacer portion of said composite strip by said inserter means into the space between said sheets formed by said spacer wedge, folding the lateral edge portions of said composite strip over the outside marginal surfaces of said glass sheets, and finishing said folded lateral edge portions to space and hermetically seal said window unit in a single operation.

3,886,014

METHOD OF PRODUCTION OF A LIQUID CRYSTAL CELL

Helmut Bayer, Vienna, Austria, assignor to Firma Electrovac Fabrikation Electrotechnischer Spezialartikel Gesellschaft m.b.H., Vienna, Austria

Division of Ser. No. 208,340, Dec. 15, 1971. This application Apr. 16, 1973, Ser. No. 351,526
Claims priority, application Austria, Dec. 21, 1970, 11509/70
Int. Cl. B32b *31/20*
U.S. Cl. 156—145 **6 Claims**



1. A method of producing a liquid-crystal cell comprising the steps of:
a. distributing substantially uniformly over a surface of a first plate grains of a particle size deviating by no more than 6 microns for grains of a particle-size range with an upper limit of 25 microns and deviating by no more than 25% of the upper particle-size limit for grains of a particle size range of more than 25 microns;
b. spacing the grains distributed on said first plate in a single layer with an intergrain spacing appreciably exceeding on the average, the grain size;
c. applying a second plate to said layer of grains on said first plate and covering said second plate with a second layer of grains;
d. repeating steps (a) - (c) to form a stack of plates with respective single layers of grains between successive plates to define respective compartments until the stack attains a predetermined number of plates;
e. heating and applying pressure to said stack of plates to bond the plates of said stack to said grains together;
f. hermetically sealing the pairs of plates defining each compartment together at their respective edge zones while leaving filling and venting openings therealong;
g. cooling said plates;
h. filling each of said compartments with a liquid-crystal material; and
i. hermetically closing said openings.

3,886,015

COMPOSITE THREAD AND PROCESS FOR MAKING THE SAME

Robert F. Turner, 190 Forrest Ln., Menlo Park, Calif. 94025

Filed Aug. 23, 1973, Ser. No. 390,720
Int. Cl. D04h *3/16*
U.S. Cl. 156—166 **4 Claims**

1. A process for manufacturing an elongate thread having physical properties different from and substantially superior to the physical properties of the individual components comprising the steps of providing a core having at least one filament, providing a tape of polymeric film having a width greater than the circumference of the filament and a length less than the length of the filament, heating the tape, applying tension to the tape to stretch the tape to a length approximating that of the filament, placing the tape in circumscribing relation to the filament while continuing the tension applying step to form a composite member and to provide an intimate interspersion of the filament within the sheath, and cooling the composite member, whereby said elongate thread has a break strength at

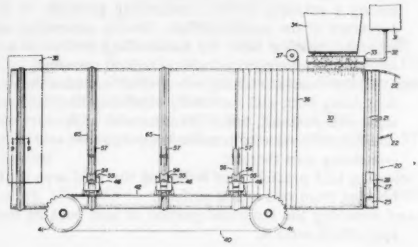
least approximately equal to the break strength of said core and tape combined.

4. An elongate thread formed according to the process of claim 3.

3,886,016
METHOD AND APPARATUS FOR MAKING A REINFORCED WALL

Agnar Gilbu, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 29, 1972, Ser. No. 316,593
Int. Cl. B65h *81/00*
U.S. Cl. 156—171 **10 Claims**



1. In a method of making an exterior peripheral support rib for a cylindrical wall structure having a longitudinal axis, the steps of

1. rotating said wall structure about its longitudinal axis,
2. winding peripherally upon said wall structure a plurality of groups of endless, resin-impregnated reinforcing filaments traversing movable guide elements located at a non-rotatable work station, said groups of filaments being axially spaced from one another along said longitudinal axis, and said filaments being tensioned axially to lie generally tangentially to said wall at the point of filament-wall contact,
3. feeding a pre-fabricated, resin-impregnated elongated rib assembly from said work station into the nip between said tangential filaments and said wall, said filaments under tension pulling said prefabricated rib assembly radially onto said wall structure,
4. continuing to feed said pre-fabricated rib assembly into nip until said wall structure is completely encircled by said prefabricated rib assembly, and
5. continuing the peripheral winding of said filaments upon said pre-fabricated rib assembly to build up a plurality of layers of filaments wound radially thereon at axially spaced portions of said pre-fabricated rib,
6. moving said guide elements relative to said rib assembly during the performance of step 5 to vary the axial spacing of said groups of filaments and
7. concurrently curing the resin of said pre-fabricated rib and of said filament windings.

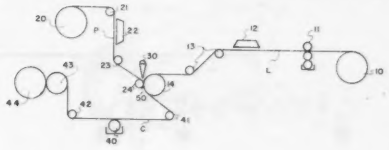
3,886,017
FIBERBOARD CARTON PRODUCT AND METHOD OF MANUFACTURE

Latane D. Brugh, Jr., and John W. Smith, Jr., both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 207,376, Dec. 13, 1971, Pat. No. 3,802,984. This application Sept. 20, 1973, Ser. No. 398,961
Int. Cl. B65h *81/00*
U.S. Cl. 156—184 **4 Claims**

1. The process of reducing the tendency of a laminated sheet material to curl in the cross-machine direction, said process comprising:

a. producing a laminated sheet by pressing a substantially 7.1 to 21.8 No./ream layer of viscous thermoplastic between a substantially 10 to 16 caliper thickness of substantially 10.0 and 11.6 No./ream/caliper density cellulosic fiber sheet and a substantially 8 to 27 caliper thickness of 8.5 to 9.0 No./ream/caliper density cellulosic fiber sheet formed from unbleached sulphate pulp;

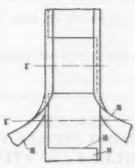


b. applying water substantially exclusively to the unbleached fiber side of said laminated sheet at the rate of 0.9 to 2.5 No./ream;
c. winding successively juxtaposed layers of said sheet into a configuration having straight line surface elements parallel with the cross-machine axis of said sheet; and
d. retaining the configuration of step C for at least 15 minutes.

3,886,018
METHOD OF MANUFACTURING CHIPS FOR AUTOMATIC DISPENSING MACHINE

Koshei Arita, 10, 23, 2-Chome Minamimagome, Ohata-ku, Tokyo, Japan

Division of Ser. No. 212,933, Dec. 28, 1971, Pat. No. 3,760,924. This application Dec. 4, 1972, Ser. No. 311,780
Claims priority, application Japan, July 29, 1971, 46-56355
Int. Cl. B32b *3/04*; **H01c** *1/14*
U.S. Cl. 156—202 **3 Claims**

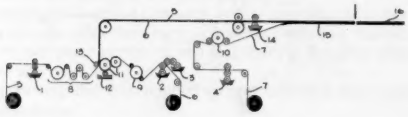


1. A method of manufacturing inexpensive heat rupturable elements for chips used in automatic dispensing machines from heat rupturable adhesive tape, heat rupturable electric resistance wire and thin metal foils, said method comprising the steps of applying the electric resistance wire to the adhesive surface of the adhesive tape in the form of a rectangular square wave shape arranged along the longitudinal axis of the adhesive tape with the two longitudinally extending parallel side segments of said rectangular square wave shape extending along the opposite side edges of said adhesive tape, bonding the metal foils over the opposite side edges of said adhesive tape and the respective parallel side segments of said rectangular wave shape arrayed resistance wire for providing electric contact thereto, and severing transversely said adhesive tape into elements at points along its length such that at least one transversely extending resistance wire segment is provided for electrically interconnecting the two opposite bonding metal foils and the underlying parallel side segments of the rectangular wave shape arrayed resistance wire.

3,886,019
METHOD OF MAKING LAMINATED CORRUGATED PAPERBOARD

Robert M. Wilkinson, Florissant, Mo., and James R. Lyon, Godfrey, Ill., assignors to Alton Box Board Company, Alton, Ill.

Continuation-in-part of Ser. No. 39,086, May 20, 1970, abandoned. This application Aug. 3, 1972, Ser. No. 277,646
Int. Cl. B31f *1/20;* **C09j** *5/02;* **B32b** *3/28, 29/00*
U.S. Cl. 156—210 **9 Claims**



1. In the art of manufacturing rigid-when-wet corrugated container-board from a preformed web of medium and at least one preformed web of liner, each of which has an obverse face and a reverse face, the processing comprising:

i. surface-treating the reverse face of the liner web by roller application of a controlled amount of a mixture composed of a curable thermosetting resionous material entrained in a vaporizable liquid vehicle, and immediately vaporizing at least a substantial part of the vehicle from the web by heating at a temperature and for a time less than that required to substantially advance the cure of the resinous material therein;

ii. surface-treating both faces of the medium web by roller application of a controlled amount of a mixture composed of curable thermosetting resinous material in a vaporizable liquid vehicle and immediately vaporizing at least a substantial part of the vehicle from the web by heating at a temperature and for a time less than that required to substantially advance the cure of the resinous material therein;

iii. corrugating the surface-treated and vehicle-vaporized medium web;

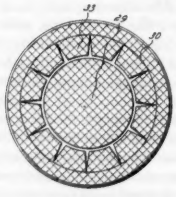
iv. adhesively uniting into a composite board the surface-treated reverse face of the liner web with the crowns of the corrugations accessible at one side of said medium web;

v. thereafter curing the residual resinous material in the composite board.

3,886,020
METHOD OF APPLYING DECALS TO SURFACES OF COMPLEX CURVATURE

Herbert C. Shank, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Aug. 17, 1972, Ser. No. 281,416
Int. Cl. B29c *27/14;* **B44c** *1/00*
U.S. Cl. 156—211 **10 Claims**



1. A method for applying a decal to an article having a curved surface, such as tableware, comprising the steps of:

forming a decal on a backing, the decal-containing area of the backing being surrounded by a non-decal containing area of said backing;

perforating the decal area with lines which extend outwardly toward the periphery of the said decal containing area and which are configured to permit the decal-containing area to conform to the curvature of the surface of the article to which the decal is to be applied;

forming other perforations defining a separable portion which is separable by tearing from the surrounding portion, the separable portion including at least a part of the decal-containing area;

thereafter positioning the decal-containing area, while still attached to the non-decal containing area, in alignment with the article surface to which the decal is to be applied, holding the non-decal containing area taut while imparting to the decal-containing area a different curvature than said non-decal containing area by pressing said decal-containing area toward said curved surface by a plunger having a pressing surface conforming generally to the curvature of the article surface, thereby separating said separable portion from the surrounding portion at said other perforations as an incident to said pressing;

holding the decal-containing area, which includes the area containing both said outwardly extending lines and said separated portions, under pressure and in contact with said article surface to transfer the entirety of said decal-containing area thereto;

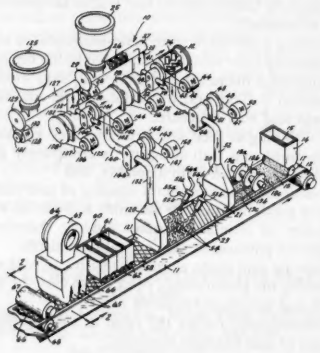
releasing said pressure and removing the held area of the backing from said article surface;

and removing the separated portion of said backing from said article surface.

3,886,021
PROCESS FOR MAKING NON-FELT, LAMINAR ROOFING MATERIAL SUCH AS COMPOSITION SHINGLES AND THE LIKE

Ernst G. Breckenfelder, Elmhurst, Ill., assignor to U.I.P. Engineered Products Corporation, Elk Grove Village, Ill.

Filed Mar. 2, 1973, Ser. No. 337,636
Int. Cl. E04d *5/08;* **B32b** *11/02*
U.S. Cl. 156—246 **10 Claims**



1. A method of producing an asphalt roofing composition comprising the steps of applying a first layer of viscous flowable asphalt onto a continuously moving supporting surface to effect a first layer of plastic asphalt material, blowing a fibrous material onto said first layer of asphalt material while said first layer is in a plastic state, applying over said fibrous coated asphalt material while in a plastic condition a second layer of viscous flowable asphalt to effect a second layer of plastic asphalt material to result in a laminated roofing composition material, positively cooling said laminated composition and removing said composition from said continuously moving supporting surface.

3,886,022
PROCESS FOR PEELING OFF AN ALUMINUM FOIL

Jiri K. Konicek, Perstorp, Sweden, assignor to Perstorp AB, Perstorp, Sweden

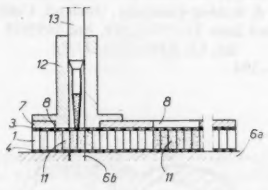
Filed May 24, 1974, Ser. No. 473,081
Claims priority, application Sweden, June 20, 1973, 73086530
Int. Cl. B32b *31/00*
U.S. Cl. 156—247 **1 Claim**

1. Process for peeling off an aluminum foil from a copper layer of a copper-clad, insulating base intended for the production of printed circuits, characterized in that the peeling off is carried out below the surface of an aqueous solution or at a continuous supply of an aqueous solution on the boundary between the copper layer and the aluminum foil.

3,886,023
STRUCTURAL PANELS OF THE SANDWICH TYPE

Henri Deplante, Paris, France, assignor to Avions Marcel Dassault Breguet Aviation, Societe Anonyme Francaise ayant son siege Social, Paris, France

Filed Mar. 30, 1973, Ser. No. 346,285
Claims priority, application France, Mar. 31, 1972, 72.11660
Int. Cl. B31d *3/02*
U.S. Cl. 156—253 **7 Claims**



1. In a method of producing sandwich panels by applying flat coverings, each including plastic material, on both sides of a cellular honeycomb-like structure, the improvement of providing reinforced nodes at selected spaced apart points of the panel for the attachment thereof to a supporting structure, by the steps comprising: while said cellular structure has at least one of its sides uncovered, completely filling each of a plurality of adjoining cells of said structure surrounding each of said points in a zone having the node point as the center thereof with a hardenable fluid resin having good adhesion to the plastic material of the coverings by pouring said resin in liquid state into each of said cells; applying the remaining covering to the cellular structure while plural cells at each such point are filled with said fluid resin; hardening said resin after both said coverings are in place; and thereafter, piercing through the coverings and the filled cellular structure along the axis of each node.

3,886,024
THICK-WALLED, FIBER-REINFORCED COMPOSITE STRUCTURES AND METHOD OF MAKING SAME

Vance A. Chase, Poway, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

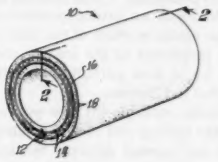
Filed Oct. 12, 1972, Ser. No. 296,998
Int. Cl. F16l *9/14*
U.S. Cl. 156—294 **7 Claims**

7. A method of making a thick-walled, fiber-reinforced composite structure comprising the steps of:

fabricating a plurality of thin-walled, fiber-reinforced resin shells of differing diameter such that said shells, when cured, can be telescoped together to produce a thick-walled structure, said resin in said shells being a high temperature curing resin curable at a temperature between about 300°F and about 350°F, each said shell having a thickness substantially less than the diameter of said thick-walled composite structure and not being greater than about 0.250 in.;

curing said thin-walled shells at the cure temperature for said resin;

interposing a low temperature curing adhesive between confronting surfaces of said cured shells so that the walls



of said cured shells alternate with said adhesive when said cured shells are telescoped together, said adhesive being curable at a temperature below about 150°F;

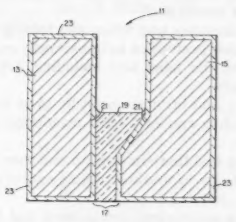
telescoping said cured shells together to build up a thick-walled composite structure; and

curing said adhesive at a temperature within its low temperature curing range to thereby bond said cured shells together to produce a cured, thick-walled composite structure.

3,886,025
FERRITE HEAD

Jacob Riseman, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1972, Ser. No. 283,614
Int. Cl. C09j *5/00;* **G11b** *5/42;* **H01f** *7/06*
U.S. Cl. 156—325 **4 Claims**



1. In a process for forming a ferrite head having a pair of ferrite members and a glass filled gap therebetween in which said glass filled is formed by positioning said ferrite members so that the gap forming surfaces are opposed to each other and flowing molten glass gapping material into said gap, the improvement which comprises forming a layer of silicon nitride on said members which layer is at least co-extensive with said glass.

3,886,026
LABEL APPLYING APPARATUS

Joseph E. Kienel, Drawer K, Acworth, Ga. 30101

Filed June 1, 1972, Ser. No. 258,818
Int. Cl. B32b *31/20;* **B65b** *13/02*
U.S. Cl. 156—361 **17 Claims**

1. An apparatus for successively applying an elongated label having an adhesive on one surface, to articles intermittently presented thereto by wrapping the ends of the label about each article to apply the label thereto, said apparatus comprising

a labeling station defining a leading end and a trailing end,

means for sequentially feeding labels along a path of

travel to said labeling station and including an endless belt defining an upper surface extending along said path of travel and across said labeling station, drive means for rotating said endless belt, and vacuum means for maintaining a label on said belt during movement along said path of travel and upon reaching said labeling station,

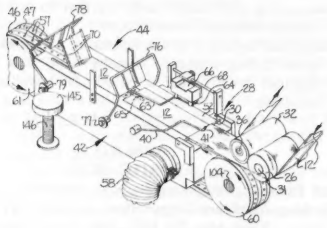
means responsive to each label reaching said labeling station for terminating operation of said feeding means,

means for sequentially lifting the leading and trailing ends of the label positioned at said labeling station and folding such ends about an article positioned to transversely overlie the medial portion of the label and including

a. means positioned at the leading end of said labeling station for at least partially lifting the leading end of each label fed thereto,

b. a vertically movable lift arm positioned immediately below the trailing end of said labeling station,

c. a first arm carried adjacent the trailing end of said labeling station and movable longitudinally along said path of travel,



d. a second arm carried adjacent the leading end of said labeling station and movable longitudinally along said path of travel, and

means for actuating said lifting and folding means upon an article being positioned to transversely overlie the medial portion of the label and including control means for sequentially

a. moving said lift arm upwardly to at least partially lift the trailing end of a label positioned at said labeling station,

b. moving said first arm toward and then away from said second arm to fold the trailing end of a label over the article, and

c. moving said second arm toward and then away from said first arm to fold the leading end of a label over the article,

manually operable switch means for actuating said control means, and

means for reactuating said feeding means to deliver another label to said labeling station upon removal of the article and the applied label from said labeling station.

3,886,027

APPARATUS FOR CONNECTING OBTUSELY ABUTTING EDGES OF ONE OR MORE CUT-OUT PIECES OF MATERIAL IN A THREE-DIMENSIONAL MOULD

Richard Hoffmann, Stetten, Germany, assignor to BIMA Maschinenfabrik GmbH, Hechingen, Germany

Filed Mar. 6, 1973, Ser. No. 338,507

Claims priority, application Germany, Mar. 7, 1972, 2210923

Int. Cl. B29c *3/00*

U.S. Cl. 156—380 **7 Claims**

1. An apparatus for welding a piece of material, comprising:

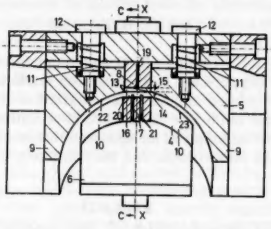
a three-dimensional upwardly convex lower mold;

a lower electrode received in said lower mold substantially in the middle thereof;

a downwardly concave upper mold complementary to said lower mold in shape;

means for lowering the upper mold toward the lower mold;

an upper electrode received in said upper mold at a position corresponding to that of said lower electrode; and



an advancing device for feeding a foil between said upper electrode and a piece of material lying on said lower mold.

3,886,028

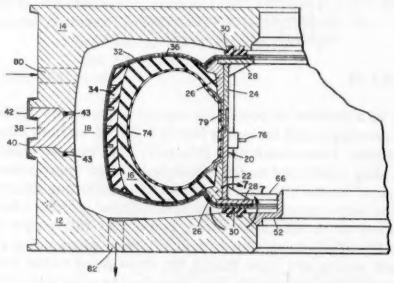
APPARATUS FOR RECAPPING TIRES WITH PRECURED TREAD RUBBER

Herbert B. Hindin, Alamo; Alfred E. Johnson, El Cerrito, and Donald P. Knapp, San Francisco, all of Calif., assignors to Oliver Tire & Rubber Company, Oakland, Calif.

Filed June 14, 1973, Ser. No. 369,975

Int. Cl. B29h *5/04, 17/36*

U.S. Cl. 156—394 **19 Claims**



1. Apparatus for retreading tires with a precured, premolded tread strip wherein a tire assembly is first formed from a tire casing with the precured tread strip placed around a bonding layer on the casing and the assembly is covered with a thin flexible envelope that extends radially inwardly along the sidewalls of the tire casing with an air bleeding means for evacuating trapped air provided between the surface of the tread strip and the flexible envelope, said apparatus comprising:

a. a multi-part rigid shell for holding said tire and precured tread assembly, said shell being generally annular with a U-shaped cross section including end walls and defining a chamber located around the tread strip of the assembly;

b. a generally annular rim means located inside of said shell for supporting said tire and tread assembly and having rim portions that are axially extensible in response to pressure within the tire casing, each said rim portion having an end member adapted to extend adjacent to an inner end wall surface of said shell when said envelope is between said end members of said rim means and said inner walls of said shell;

c. sealing means for providing a fluid-tight seal between the exterior surface of said flexible envelope and the inner

end walls of said shell in the area adjacent said end portions of said rim means;

d. fluid inlet and exhaust means for admitting pressurized fluid within the chamber defined inside of said shell and around said tire assembly; and

e. inlet means on said rim means for allowing the interior of said tire to be pressurized and thereby cause said cylindrical rim portions to extend axially and force said sealing means to seal said chamber around said tire assembly.

3,886,029

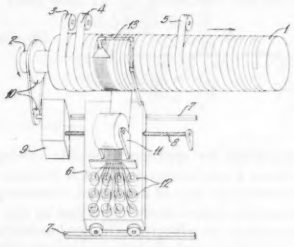
METHOD AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF FIBER REINFORCED PLASTIC PIPES OF VARIABLE WALL THICKNESS

Peder Ulrik Poulsen, Esrum, Denmark, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 217,115, Jan. 12, 1972, Pat. No. 3,788,918. This application Oct. 24, 1973, Ser. No. 409,193

Int. Cl. B65h *81/00*; **B31c** *13/00*

U.S. Cl. 156—429 **10 Claims**



1. In apparatus for the formation of shells of the type having a mandrel which both rotates and is moved axially at a uniform rate to provide two degrees of mandrel movement that are generally at right angles to each other, the improvement comprising: guide means positioned to one side of the mandrel for continuously feeding the materials which produce the shell onto the mandrel in a band having a width greater than said axial rate of mandrel movement; drive means for moving said guide means back and forth generally parallel to one of said degrees of mandrel movement and which synchronizes guide means movement with mandrel movement; and cyclic programming means causing said drive means to move said guide means in one of said degrees of movement at a rate no greater than that of said mandrel to produce one thickness of shell and then move said guide means in the opposite direction to produce a minimum thickness of shell.

3,886,030

WEB SPLICING APPARATUS

Peter Hurst, 619 A, Ashingdon Rd., Rochford, Essex, England

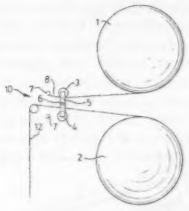
Filed Dec. 4, 1972, Ser. No. 311,678

Claims priority, application United Kingdom, Dec. 6, 1971, 56634/71

Int. Cl. B65h *19/18*

U.S. Cl. 156—504 **3 Claims**

1. Apparatus for splicing a moving web comprising, a pair of parallel web guides which are spaced apart to define between them a single path through which the moving web can pass, a common carrier on which said pair of web guides are mounted, said carrier having a pivot axis spaced laterally between and parallel with said pair of web guides, said carrier being pivotable about said axis to cause orbital movement of the web guides, means adjacent said carrier and spaced from the web guides for releasably holding a second web under tension and adjacent one web guide of the pair of web guides, which second web is stationary and a portion of which is provided with an adhesive coating whereby it can be secured to said moving web, and means connected to pivot said carrier to move said web guides from positions in which the moving web and the second web are mutually remote to positions in which the webs are brought into surface-to-surface contact with one another and the resultant combined web is constrained to follow a sinuous path about said pair of web guides to ensure intimate contact between the two webs, whereupon the second web is released by the tensioning means, the means



for releasably holding the second web under tension being disposed such that the stationary web can be held against either web guide, the arrangement being such that pivoting of the carrier in one direction will effect splicing of the webs when the stationary web is held against one of the web guides and pivoting of the carrier in the other direction will cause splicing of the webs when the stationary web is held against the other of the web guides.

3,886,031

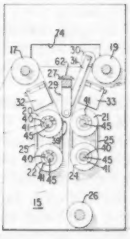
WEB LAP SPLICER

Charles M. Taitel, Parsippany, N.J., assignor to Compensating Tension Controls Inc., Orange, N.J.

Filed June 10, 1974, Ser. No. 477,857

Int. Cl. B65h *19/08*

U.S. Cl. 156—504 **13 Claims**



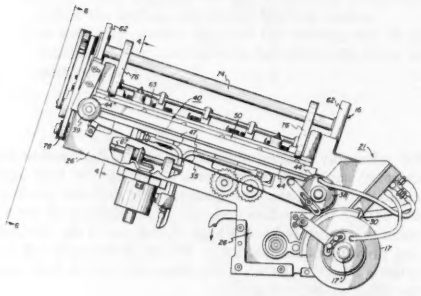
1. Apparatus for splicing the end of web material from a spare supply roll to web material being drawn from a depleting supply roll comprising in combination first and second leading nip rollers and first and second trailing nip rollers spaced from said leading rollers, each of said first and second rollers being normally spaced apart, at least one of said leading rollers and at least one of said trailing rollers being mounted to be moveable toward the other of said leading and trailing rollers, endless conveyor means extending between said first rollers, second endless conveyor means extending between said second rollers, directing the running web between said conveyor means in close proximity to said second leading roller, means for directing the web from said spare roll between said leading rollers and in close proximity to said first leading roller, and means for moving said moveably mounted leading and trailing rollers to bring said leading and trailing rollers together so that the spare web and the running web are pressed together to be joined by a piece of tape applied to the spare web.

3,886,032

ADDRESSING MACHINE LABEL TRANSPORT

Herbert C. Artelt, Jr., Wildwood, Ill., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 36,888, May 13, 1970, abandoned. This application July 10, 1972, Ser. No. 270,387
Int. Cl. B32b 31/00
U.S. Cl. 156—521 6 Claims



1. In an article addressing machine adapted for use with uncut labels in the form of a continuous strip arranged in at least two longitudinally extending rows, said machine including addressing means for bringing individual labels into physical contact with said articles, with means for feeding said articles to said addressing means for addressing thereof, the combination of:

means for separating said strip into individual labels for use by said addressing means,

transport means for carrying said labels from said separating means to said article addressing means, said transport means including a movable belt-like conveyor operatively arranged adjacent the discharge side of said separating means so as to receive said labels as they are discharged by said separating means, and vacuum means for releasably tacking said labels to said conveyor belt

means for feeding said strip forward to said separating means, said separating means including first knife means adapted to cut said strip longitudinally between said label rows as said strip is fed forward to said separating means by said strip feeding means, said spearating means including second knife means downstream of said first knife means for cutting said strip transversely into individual labels, said conveyor belt extending across the discharge side of said second knife means whereby to receive said labels as they are discharged by said second knife means; and

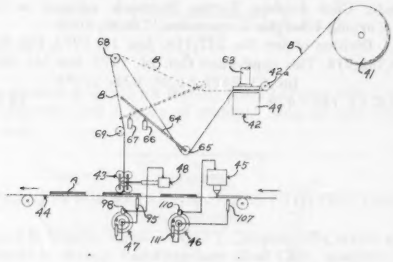
drive means for said addressing machine having means for moving said conveyor belt and said separating means in timed relation with said addressing means, said second knife means being adapted to cut in scissors-like fasion transversely across said label form so that said labels are deposited on said moving conveyor belt in predetermined spaced relationship for use by said addressing means.

3,886,033

METHOD AND APPARATUS FOR APPLYING A CUTTING STRIP TO A CONTAINER

William MacDonald; George Webb, both of Weston, Ontario; Peter Waldburger, Toronto, Ontario, and Robert G. Hughes, Rexdale, Ontario, all of Canada, assignors to Continental Can Company of Canada Limited, Toronto, Ontario, Canada

Filed Nov. 6, 1972, Ser. No. 303,870
Claims priority, application United Kingdom, Feb. 25, 1972, 8778/72
Int. Cl. B32b 31/00; B31d 5/00
U.S. Cl. 156—522 10 Claims



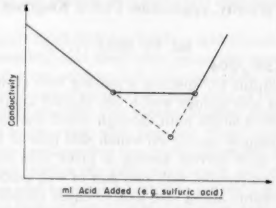
1. An apparatus for applying a flexible cutting strip to a container from a continuous roll which includes means for feeding a continuous strip of a material, conveying means for passing a plurality of containers in line one by one, through an application station, an adhesive extruder located adjacent the conveying means for applying adhesive to one of the continuous strip and a corresponding area on the container, means for cutting a predetermined length of the continuous strip to be applied to the container, means for applying the cut predetermined length of strip to the container with the adhesive at the application station, means for forming a serrated edge continuously along one edge of the strip provided upstream of said cutting means, means coordinating the application of adhesive and means for coordinating the application of the predetermined lengths of strip to each container.

3,886,034

PROCESS FOR DETERMINING THE CONDITIONS NEEDED IN CONTROLLABLY OBTAINING SULFATE PULP HAVING A PREDETERMINED KAPPA NUMBER

Sture Erik Olof Noreus, Husum, Sweden, assignor to Mo Och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation-in-part of Ser. No. 142,226, May 11, 1971, abandoned. This application Oct. 2, 1973, Ser. No. 402,697
Claims priority, application Sweden, May 15, 1970, 6795/70
Int. Cl. D21c 7/12
U.S. Cl. 162—49 23 Claims



1. A process for determining the conditions needed in controllably obtaining a predetermined degree of delignification and therefore a predetermined Kappa number in the manufacture of sulfate pulp from wood, and then pulping the wood

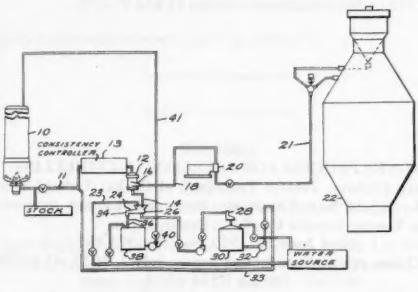
under the conditions thereby determined, using an alkaline pulping liquor comprising an alkali metal hydroxide and an alkali metal sulfide, which comprises taking a sample of alkaline pulping liquor at an early stage in the pulping of the wood to be pulped at which from at least 20 percent up to about 85 percent of the alkali added initially has been consumed, titrating the sample with an acid to the end point at which the conductivity of the sample has decreased to a relatively constant value, determining from the amount of acid added during the titration the alkali concentration at this end point, and from this alkali concentration determining the "H" factor at the desired Kappa value in the finished sulfate pulp, and from the "H" factor determining the pulping time and temperature relationship needed to obtain pulp of this Kappa value, and then pulping the wood at the determined time and temperatures to obtain pulp of this Kappa value.

3,886,035

PROCESS FOR SEPARATING KNOTS FROM PULP

Oliver A. Laakso, Glen Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Mar. 12, 1973, Ser. No. 339,759
Int. Cl. D21c *3/22*
U.S. Cl. 162—55 **7 Claims**



1. A method for digesting wood chips and knots comprising:

a. immersing the wood chips and knots in a digesting liquor under pressure of from about 150–250 psig to chemically reduce at least some of the wood chips to their constituent fibers;

b. washing the wood chips and knots with water to separate the partially reduced wood chips, fibers and knots from the digesting liquor and to form a pressurized pulp comprising water and partially reduced wood chips, fibers and knots having a solids consistency of about 10–15 percent;

c. separating the partially reduced wood chips and at least most of the fibers from the knots at a solids consistency of about 10–15 percent, and

d. passing the partially reduced wood chips and fibers to subsequent treatment.

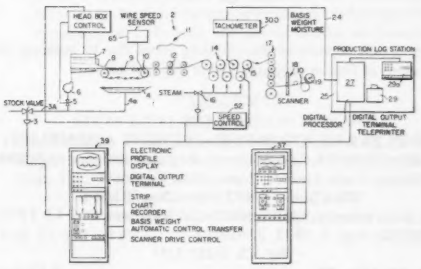
3,886,036

METHOD OF CONTROLLING A DRIER LIMITED PAPER MACHINE

Erik B. Dahlin, Saratoga, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 233,937, March 13, 1972, abandoned. This application May 20, 1974, Ser. No. 471,228
Int. Cl. D21f *1/08, 7/00, 9/00*
U.S. Cl. 162—198 **1 Claim**

1. In a method of controlling a paper machine having a pulp stream flow feeding into a headbox and controlled by a pulp stream valve to thereby control total head, T_H, said headbox being provided with rectifier rollers and a slice that permits pulp to jet onto a moving wire to form a paper sheet and from which the water passing through is collected, mixed with stock from a stock flow line controlled by a stock flow valve and supplied to the pulp stream, said sheet then being passed at a characteristic master speed through a drier section to which steam is supplied in a dryer limited mode, the steps comprising: scanning said sheet after the dryer section and determining a value related to the moisture of said sheet, comparing said measured value with a target value for said moisture content, and utilizing the moisture error signal therefrom to manipulate at substantially every scan said master speed so that said moisture content is maintained within specifications; determining a value related to conditioned weight of said sheet, comparing said measured value with a target value for said conditioned weight, and utilizing the error signal therefrom to manipulate said stock flow valve so that conditioned weight remains within specifications; cross-coupling conditioned weight error signals to master speed and to said moisture error signal so that changes in conditioned weight error signals will not upset moisture, crosscoupling said moisture



error signal to said stock flow so that changes in moisutre error signal will not upset conditioned weight; coupling said moisture error signal modified by said crosscoupled weight error signals to a control loop wherein the total headbox head, T_H, is controlled by manipulating said pulp stream valve, said coupling being such that the jet-to-wire ratio remains constant; coupling said headbox head control loop with said headbox slice such that said slice will be adjusted in response to jet velocity changes to keep the pulp fiber concentration for the sheet constant; detecting the rotational velocity of said rectifier rollers; supplying said detected velocity to a rectifier roller compensation signal generator; generating a rectifier roller compensating signal based on the detected roller velocity such that said compensating signal eliminates pressure differentials at the slice caused by the rotational velocity of said rollers when said compensating signal is supplied to said headbox head control loop; and supplying said rectifier roller compensating signal to said headbox head control loop.

3,886,037

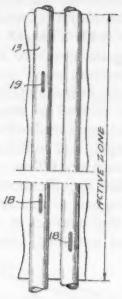
NUCLEAR FUEL PIN CONTROLLED FAILURE DEVICE

Larry D. Schlenker, Idaho Falls, Idaho, assignor to The United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 17, 1973, Ser. No. 389,287
Int. Cl. G21c *3/06*
U.S. Cl. 176—68 **8 Claims**

1. A fuel assembly for a water-cooled nuclear reactor including a plurality of parallel, slender elongated fuel pins held together in square array to form a fuel bundle, said fuel pins containing nuclear fuel hermetically sealed with a cladding tube and including means associated with said cladding tubes for rupturing the cladding tubes at a predetermined location said means for rupturing the cladding tubes being all oriented in the same azimuthal direction within the fuel bundle

whereby hydraulic resistance to the flow of emergency core coolant will be minimized in the event a loss-of-coolant acci-



dent causes rupture of the cladding tubes due to build-up of pressure of fission products within the fuel pins.

3,886,038

NUCLEAR REACTOR FUEL ELEMENT ASSEMBLIES

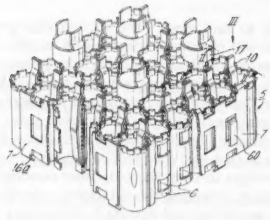
Leonard Fredrick Raven, Crewe, England, assignor to British Nuclear Fuels Limited, Lancashire, England

Filed Jan. 15, 1973, Ser. No. 323,897

Claims priority, application United Kingdom, Jan. 13, 1972, 1758/72; Aug. 1, 1972, 35919/72

Int. Cl. G21c *3/34*

U.S. Cl. 176—78 **2 Claims**



1. A spacer grid for spacing apart a plurality of cylindrical nuclear fuel pins in a stream of coolant flowed over the surface of said pins parallel to the axis thereof, the grid comprising a plurality of cojointed, open ended, cylindrical ferrules, each ferrule having one rim defining part of the downstream face of the grid and its other rim defining part of the upstream face of the grid, positioning means for each ferrule positioning a fuel pin in spaced relation to the inner face of the ferrule said means including a pair of circumferentially spaced, co-planar rigid stop members extending inwardly from the inner face of the ferrule and a spring member also extending inwardly from the inner face of the ferrule with the line of action of the spring member being opposite to and extending between the stop members to urge a fuel pin into engagement with the rigid stop members, said spring member serving to position a fuel pin so that an annular clearance is defined between the pin and the inner wall of the ferrule whereby substantially uniform heat exchange between the fuel pin and the coolant may occur around the part of the circumference of the fuel pin lying within the grid, the said one rim of at least some ferrules being shaped to promote turbulence in the coolant leaving the downstream side of the grid and deflectors for deflecting coolant preferentially into the ferrules located on said other rim of the ferrules defining the upstream edge of the grid.

3,886,039

METHOD FOR PRODUCING L-GLUTAMINE

Fumihiro Yoshinaga, Fujisawa; Takayasu Tsuchida; Kenji Kikuchi, both of Kawasaki, and Shinji Okumura, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 12, 1973, Ser. No. 424,094

Claims priority, application Japan, Dec. 16, 1972, 47-126484

Int. Cl. C12d *13/06*

U.S. Cl. 195—29 **2 Claims**

1. A process for producing L-glutamine which comprises culturing a microorganism resistant to at least one sulfa drug of the group consisting of sulfapyridine, sulfathiazole, phthalylsulfathiazole, sulfadiazine, sulfaguanidine, sulfamethazine, sulfamerazine, sulfadimethoxine, sulfamethomidine, sulfamethoxypyridazine, sulfisomidine, sulfisoxazole, acetosulfamine, sulfanylamide, sulfisomezole, sulfaphenazole, sulfamethizole, sulfaethidole, sulfapyrazine, irgafen and irgamide, under aerobic conditions in an aqueous culture medium containing assimilable sources of carbon and nitrogen and inorganic salts necessary for the growth of said miroorganism until L-glutamate accumulates in said medium, and recovering accumulated L-glutamine from said culture medium, said microorganism being Brevibacterium flavum FERM P-1684, Brevibacterium flavum FERM P-2371, Corynebacterium glutamicum FERM P-2372, Corynebacterium glutamicum FERM P-2373 or Microbacterium flavum FERM P-2374.

3,886,040

NOVEL PROCESS FOR PREPARING L-CITRULLINE

Ichiro Chibata; Tetsuya Tosa, both of Osaka; Tadashi Sato, Kyoto, and Kozo Yamamoto, Osaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed June 25, 1973, Ser. No. 373,497

Claims priority, application Japan, July 3, 1972, 47-66928

Int. Cl. C12d *13/06*

U.S. Cl. 195—29 **5 Claims**

1. A process for preparing L-citrulline or a mixture of L-citrulline and D-arginine which comprises polymerizing at least one acrylic monomer in an aqueous suspension of microbial cells of *Pseudomonas putida* ATCC 4359 to produce immobilized microbial cells thereof, and subjecting said immobilized cells to enzymic reaction with L- or DL-arginine or an organic acid addition salt thereof.

3,886,041

PRODUCTION OF CITRIC ACID BY SUBMERGED FERMENTATION

Adel J. Kabil, Vienna, Austria, assignor to Aktiengesellschaft Jungbunzlauer Spiritusund Chemische Fabrik, Vienna, Austria

Filed Aug. 17, 1972, Ser. No. 281,368

Claims priority, application Austria, Aug. 18, 1971, 7219

Int. Cl. C12d *1/04*

U.S. Cl. 195—36 R **3 Claims**

1. In a process for the production of citric acid which comprises the submerged fermentation of a carbohydrate containing material by means of the fungus Aspergillus niger with the addition of an alkaline substance the improvement which comprises added sodium hydroxide to the fermenting medium in portions for maintaining the pH value of the fermentation medium at a value between 1.5 and 2.0, whereby the first addition is made at a time 24 to 36 hours after inoculation.

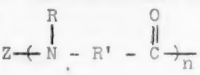
3,886,042

ACYLATION OF PROTEOLYTIC ENZYMES

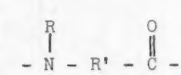
Shmaryahu Blumberg; Barton Holmquist, and Bert L. Vallee, all of c/o Biophysics Research Laboratory, Peter Bent Brigham Hospital, Boston, Mass. 021115

Filed Mar. 13, 1974, Ser. No. 450,772
Int. Cl. C07g 7/02
U.S. Cl. 195—62 32 Claims

1. A proteolytic enzyme containing one or more amino acid residues per molecule selected from the group consisting of tyrosyl, lysyl, threonyl, seryl, histidyl, and cysteinyl residues, said enzyme being modified by one or more of said residues being acylated with an acyl group of the formula:



wherein Z is hydrogen or an organo blocking group, each



is an amino acid residue, and n is at least 1.

3,886,043

PROCESS FOR PREPARING PURE PORCINE BETA-TRYPSIN

John Walker, and Borivoj Keil, both of St. Remy Les Chevreuse, France, assignors to Choay S.A., Paris, France

Filed Aug. 22, 1973, Ser. No. 390,340
Claims priority, application France, Aug. 24, 1972, 72.30127; Aug. 14, 1973, 73.29620
Int. Cl. C07g 7/026
U.S. Cl. 195—66 R 8 Claims

1. A process of preparing substantially pure porcine β-trypsin, comprising purifying crystallized porcine trypsin by chromatography on sulfonated ion exchangers of a solution of said crystallized porcine trypsin in a tris(hydroxymethyl-)aminomethane buffer which has a resistance greater than 0.21×10^3 Ohm, and collecting substantially pure porcine β-trypsin in the fractions which issue as the last out of the chromatographic separation and which are essentially free of degraded forms of trypsin.

3,886,044

PROCESS OF MAKING CEPHAMYCIN C BY FERMENTATION

Edward Inamine, Rahway, and Jerome Birnbaum, Morganville, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 25, 1974, Ser. No. 464,007
Int. Cl. C12d 9/00
U.S. Cl. 195—80 R 14 Claims

1. In the process for preparing cephamycin C by growing a cephamycin C producing specie of Streptomyces in a nutrient medium, the improvement which comprises the addition of D-lysine or DL-lysine to the nutrient medium.

3,886,045

PROCESS FOR THE ENZYMATIC DETERMINATION OF GLUCOSE WITH A GLUCOSE-OXIDASE/PEROXIDASE ENZYME SYSTEM

Franco Meiattini, Via Montanini 140, Siena, Italy

Filed May 11, 1973, Ser. No. 360,372
Claims priority, application Italy, May 12, 1972, 9480/72
Int. Cl. C12k 1/04; C07g 7/02
U.S. Cl. 195—103.5 14 Claims

1. A process for the enzymatic determination of the amount of glucose present in body fluids which comprises the steps:

i. adding to a sample of a body fluid an enzymatic system containing glucose-oxidase and peroxidase, to which has been added sodium or potassium ferrocyanide,

ii. incubating the sample and enzyme system at room temperature whereby the ferrocyanide is converted to ferricyanide equivalent to the amount of glucose present in the sample, and

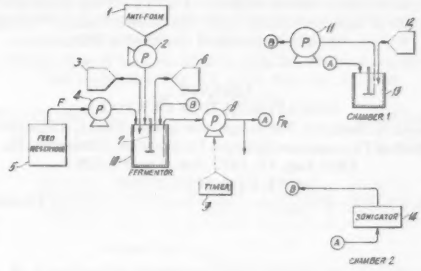
iii. reacting the ferricyanide with a reducing system which forms a colored product on oxidation, the color being a measure of the ferricyanide present, said reducing system consisting of a phenolic compound and an aminoantipyrine.

3,886,046

RECYCLE FERMENTATION PROCESS

Thomas Benton Young, Lambertville, N.J., and H. Michael Koplove, Watertown, Mass., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 28, 1973, Ser. No. 374,721
Int. Cl. C12b 1/00; C12d 9/00
U.S. Cl. 195—115 10 Claims



1. A fermentation process which comprises growing microorganisms that produce a useful product in an aerated nutrient medium in an agitated fermentor, continuously and aseptically removing at a predetermined rate broth containing microorganisms and product from said fermentor after the microorganism mass concentration in said fermentor has reached a desired level, destroying the viability of part or all of the microorganisms in said broth in the presence of said useful product under conditions which are not destructive to said product, and continuously recycling said broth containing product and partially or totally non-viable microorganisms to said fermentor such that the specific rate of destruction of microorganisms in said broth is equal to the specific growth rate less the dilution rate of microorganisms in the fermentor.

3,886,047

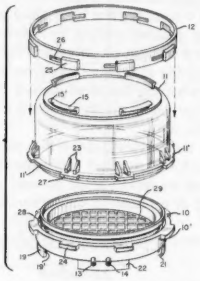
CULTURE CHAMBER

James Otis Billups, Jr., Del Mar, Calif., assignor to Billups-Rothenberg, Inc., Del Mar, Calif.

Filed Nov. 2, 1973, Ser. No. 412,343
Int. Cl. C12b 1/00
U.S. Cl. 195—139 5 Claims

1. A culture chamber comprising, in combination:

a. a circularly shaped base having a smoothly rounded concave lower interior and upper annular base edge;
b. a circularly shaped lid having a smoothly rounded concave upper interior and lower annular lid edge dimensioned to seat on said base edge; and
c. a locking ring arranged to telescope over the top of said lid to circumferentially surround in overlapping relationship the upper annular base edge and lower annular lid edge, said upper annular base edge including a plurality



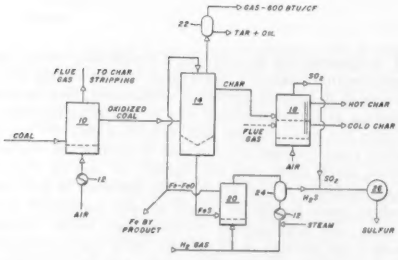
of circumferentially spaced radially extending lips and the lower annular lid edge including a plurality of circumferentially spaced radially extending lips, said locking ring having a plurality of circumferentially spaced pockets and associated slots, the pockets extending radially outwardly from the ring and the slots being formed in adjacent portions of the ring so that the pockets receive the opposed lips, rotation of the locking ring causing the slots to receive circumferentially the lips to thereby lock the base and lid together by means of the locking ring.

3,886,048

DESULFURIZATION OF COAL

Joseph G. Selmeczi, Pittsburgh, and Joseph Vlnaty, Aliquippa, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1973, Ser. No. 389,338
Int. Cl. C10b *57/00, 57/04*
U.S. Cl. 201—17 **6 Claims**



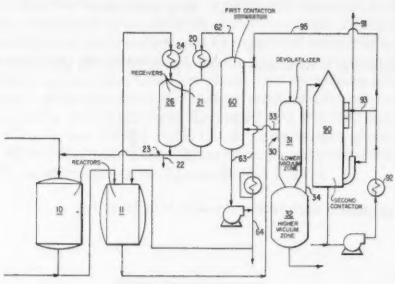
1. The method of carbonizing and desulfurizing coal which has been decaked comprising:
a. heating the decaked coal admixed with a desulfurizing material selected from the group consisting of iron, iron oxide and the mixture thereof, produced from coal pyrites, which desulfurizing material has been regenerated by contact with a hydrogen-containing gas, such that the percentage of the desulfurizing material is between 3 and 30% by weight of the admixture, in a reducing atmosphere between 1,200°–1,700°F for between 5 to 60 minutes to form a partially desulfurized char;
b. separating the desulfurizing material from the resulting char; and
c. subjecting the resulting char to an oxidizing atmosphere at a temperature of between 800–1,100°F, whereby a desulfurized char is produced which contains less than one percent sulfur.

3,886,049

RECOVERY OF ALKENYL-AROMATIC MONOMERS BY FALLING STRAND DEVOLATILIZATION

Wallace G. Bir, Creve Coeur, Mo., and Joseph Novack, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 9, 1973, Ser. No. 339,784
Int. Cl. B01d *3/00;* **C07c** *7/18*
U.S. Cl. 203—9 **12 Claims**



1. A continuous on-line process for recovery of alkenylaromatic monomer, selected from styrene, alkyl substituted styrenes and halogenated styrenes, from a stream containing alkenylaromatic monomer, alkenylaromatic high polymer, alkenylaromatic oligomers, high boiling organic compounds and inert hydrocarbons, and for reducing the concentration of alkenylaromatic oligomers and high boiling organic compounds in said recovered alkenylaromatic monomer, which process comprises the steps of continuously and simultaneously
A. subjecting an alkenylaromatic polymer-monomer melt containing additionally alkenylaromatic oligomers, high boiling organic compounds, and inert hydrocarbons to falling strand devolatilization in at least two consecutive flash vaporization zones maintained at a temperature of from 170° to 280°C and a pressure of from 1 to 200 mm of Hg A, wherein the second vaporization zone is maintained at a lower pressure than the first vaporization zone;
B. contacting in a first contacting and separation zone a stream of vapor from the first flash vaporization zone with a liquid comprising a mixture of alkenylaromatic monomer, alkenylaromatic oligomers, high boiling organic compounds and inert hydrocarbons, whereby the vapor stream exiting said contacting and separation zone has a reduced concentration of oligomers and high boiling organic compounds compared to the entering stream of vapor, separating the resulting vapor from said contacting liquid and removing said resulting vapor stream;
C. directly contacting in a second contacting zone a stream of vapor from the second flash vaporization zone with a liquid having a temperature of less than 25°C. to condense substantially all alkenylaromatic monomer, oligomers, high boiling organic compounds and inert hydrocarbons contained in said vapor stream from the second flash vaporization zone and removing a stream of condensed liquid from said second contacting zone;
D. passing at least a portion of said condensed liquid stream to said first contacting and separation zone as additional contacting liquid; and
E. collecting said contacting liquid from said first contacting and separation zone in a sump region associated with said

first zone and circulating said contacting liquid back to said first contacting and separation zone while maintaining a desired level of said contacting liquid in sump region.

3,886,050

PROCESS FOR THE PREPARATION OF PURE PHTHALIC ANHYDRIDE

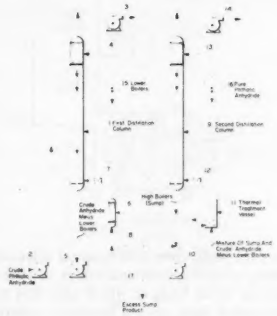
Wolfgang Deutner, and Robert Neumann, both of Linz, Donau, Austria, assignors to Chemie Linz AG, Linz, Austria

Filed Aug. 1, 1969, Ser. No. 846,673

Claims priority, application Austria, Aug. 2, 1968, 7534/68; Oct. 31, 1968, 10606/68

Int. Cl. B01d *3/10*

U.S. Cl. 203—80 **3 Claims**



1. A process for purifying crude phthalic anhydride obtained by oxidizing o-xylene or naphthalene with air, which comprises (1) distilling from the crude product, under reduced pressure, components of lower boiling point than phthalic anhydride, (2) adding to the resultant product the sump product of step 4 in an amount of at least 50 parts by weight per part by weight of the crude phthalic anhydride, (3) thermally treating the resultant mixture at a pressure which is at least equal to the vapor pressure of the mixture, thereby preventing boiling of the mixture, and (4) distilling, under reduced pressure, pure phthalic anhydride from the mixture, thus leaving as sump product impurities having a higher boiling point than phthalic anhydride.

3,886,051

METHOD OF MAKING JEWELRY AND THE LIKE

Patrick J. Albright, 429 Powell Ave., and Joseph P. Roberts, 300 Maple Ave., both of Cresson, Pa. 16630

Filed Nov. 14, 1973, Ser. No. 415,736

Int. Cl. B44c *1/04;* **B23p** *1/02*

U.S. Cl. 204—18 R **10 Claims**

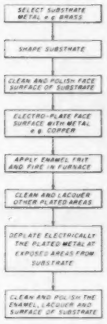
1. A method of supporting a vitreous film upon a substrate including the steps of:

selecting a substrate having an electrically conductive facing surface,

electroplating said facing surface with a metal layer for adherence of a vitreous film,

forming a bounded area of vitreous film upon the electroplated metal layer, and

electrically deplating only the exposed area of the plated metal layer from the substrate by using the bounded area of the vitreous film as a mask to thereby expose areas of said conductive facing surface distinct from said bounded areas of vitreous film, said electrically deplating including


SELECT SUBSTRATE METAL e.g. BRASS
SHAPE SUBSTRATE
CLEAN AND POLISH FACE SURFACE OF SUBSTRATE
ELECTRO-PLATE FACE SURFACE WITH METAL e.g. COPPER
APPLY ENAMEL FRIT AND FIRE IN FURNACE
CLEAN AND LACQUER OTHER PLATED AREAS
DEPLATE ELECTRICALLY THE PLATED METAL AT EXPOSED AREAS FROM SUBSTRATE
CLEAN AND POLISH THE ENAMEL, LACQUER AND SURFACE OF SUBSTRATE

establishing said electrically conductive facing surfaces of the substrate as an electrode.

3,886,052

METHOD OF MAKING A MAGNETIC RECORDING DISC

Robert Samuel Smith, San Jose, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 56,555, July 20, 1970, abandoned. This application Feb. 12, 1973, Ser. No. 331,646

Int. Cl. C23b *5/62*

U.S. Cl. 204—33 **13 Claims**

8. A method for producing a magnetic film on an aluminum substrate to form a magnetic information storage member which has information recorded thereon or read therefrom by a magnetic head while moving with respect to said head comprising the steps of

polishing the surface of the aluminum substrate to a smoothness of at least three microinches,

cleaning the polished surface in a soap solution to remove residues and particulate matter,

anodizing the substrate surface in a phosphoric acid solution to remove alloying precipitates from the surface of the aluminum and to form a porous oxide film on said surface, said pores extending through the oxide film surface to the aluminum surface,

plating a film of copper on the oxide film surface from a copper plating bath containing copper sulfate and sulfuric acid,

polishing the surface of said copper film,

etching said copper film in an acid solution,

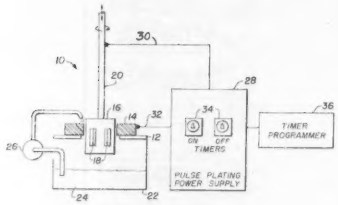
electroplating a layer of ferromagnetic material on said copper film to form said magnetic film,

and heating said substrate at an elevated temperature for a selected time period to form an oxide layer on the surface of said ferromagnetic layer whereby a thin wear resistant surface is formed on said magnetic film.

3,886,053
PROGRAMMABLE PULSE ELECTROPLATING PROCESS

James M. Leland, 4591 Mt. LaPlatta Pl., San Diego, Calif. 92117

Filed Nov. 1, 1973, Ser. No. 411,962
Int. Cl. C23b *3/06, 5/50, 5/56*
U.S. Cl. 204—36 5 Claims



1. The method of controlling the plating hardness in a honeforming process in which the surface of a metal workpiece is cathodically electroplated in an electrolytic chromium plating solution generating hydrogen at the workpiece surface, with a tool having a honing surface movable relative to and in engagement with the workpiece comprising the steps of:

applying a DC current through said electrolytic solution;

interrupting the flow of current through said solution to provide alternate deposition periods and non-deposition periods of predetermined duration;

gradually decreasing the duration of the non-deposition periods during the plating process;

whereby during the deposition period a layer of chromium is deposited on the work surface simultaneously with the honing operation, and during the non-deposition period a predetermined amount of the hydrogen is allowed to escape to control the hardness of the chromium applied to the surface of the workpiece and to reduce the stress between the plating and the workpiece, the hardness of the plating increasing as the duration of the non-deposition period decreases.

3,886,054
ALKALINE BRIGHT ZINC PLATING

Joseph R. Duchene, Southfield, Mich., and Philip J. De Christopher, Chicago, Ill., assignors to Richardson Chemical Company, Des Plaines, Ill.

Filed Sept. 24, 1973, Ser. No. 400,427
Int. Cl. C23b *5/10, 5/46*
U.S. Cl. 204—55 R 30 Claims

1. A bright zinc, cyanide-free electroplating bath comprising an aqueous alkaline solution containing a source of zinc ions, and from about 0.25 to about 5 grams per liter of a quarternized polymeric condensate of an alkylene polyamine having at least one tertiary amino group and a 1,3-dihalo-2-propanol where the mol ratio of the polyamine to the dihalopropanol ranges from about 5.0:1 to 1.75:1, respectively.

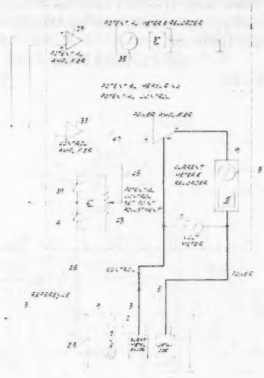
2. The electroplating bath of claim 1 wherein the bath contains from about 0.1 to about 5 grams per liter of an aldehyde brightener.

18. The electroplating bath of claim 1 wherein the bath contains from about 0.01 to about 0.2 grams per liter of a heterocyclic compound selected from the group consisting of a 2-mercapto substituted pyridine or pyrimidine.

3,886,055
ELECTROLYTIC SEPARATION OF METALS

Robert Baboian, North Attleboro, and Gardner S. Haynes, Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 12, 1973, Ser. No. 423,948
Int. Cl. C23b *1/00*; B01k *3/00*
U.S. Cl. 204—146 10 Claims



1. A process for separating a first metal selected from the group consisting of silver, gold and alloys of silver and gold from a composite metal body in which said first metal is adhered as an external layer over a substrate constituted by a second metal selected from the group consisting of ferritic and austenitic stainless steels, the process comprising the steps of: immersing the body in a solution containing between about 1 and about 10% by weight of an alkali metal cyanide and up to about 10% by weight of an alkali metal hydroxide;

supplying direct current to said body from the positive terminal of a direct current power source whose negative terminal is connected to a second electrode immersed in said solution thereby establishing an electrolytic circuit in which said body is the anode and said second electrode is the cathode;

arranging a saturated calomel standard electrode adjacent said composite metal body for continuously determining the voltage of said anode relative to said standard electrode; and

continuously regulating the voltage applied between said anode and cathode for maintaining the voltage of said anode relative to said standard electrode within the range from −0.6 to +0.5 volts for causing selective removal of said first metal from said body.

3,886,056
PROCESS FOR PRODUCING A HIGH MELTING TEMPERATURE POLYETHYLENE EMPLOYING IRRADIATION AND ORIENTING

Ryozo Kitamaru, 11, Hanazonoenjyoji-cho, Ukyo-ku, Kyoto-shi; Hyon Don Chu, 5-36-8, Honmachi, Koganei-shi, Tokyo-to, and Waichiro Tsuji, 181/16, Manjyojiki-cho, Fukakusa-Okamedani, Fushimi-ku, Kyoto-shi, all of Japan

Filed Nov. 1, 1972, Ser. No. 302,761
Claims priority, application Japan, Nov. 1, 1971, 46-86981
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—159.2 8 Claims

1. A process for producing a high melting temperature polyethylene which comprises irradiating a polyethylene with X-rays, γ-rays or electron beam to a dosage of from 0.2 to 16 Megarads to produce crosslinked polyethylene having a gel

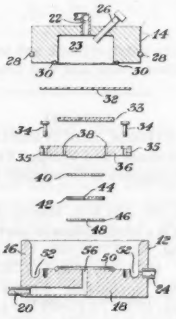
content of at least one weight percent, extending the crosslinked polyethylene in at least one direction at a temperature of at least the anisotropic melting point of at least 150°C of the crosslinked polyethylene and cooling the crosslinked polyethylene, said starting polyethylene having a viscosity average molecular weight of from 1×10^5 to 4×10^5 and having a melting point of 137° to 138°C when crystallized isothermally from the melt at a temperature of 130°C.

3,886,057

CELL USEFUL FOR DETERMINING WATER VAPOR TRANSMISSION RATE OR WATER CONTENT

Roger L. Bredeweg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 1, 1971, Ser. No. 111,557
Int. Cl. G01n *27/42*
U.S. Cl. 204—195 W **1 Claim**



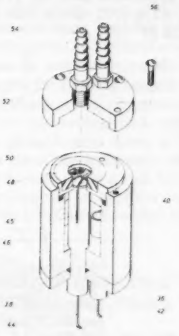
1. A cell for absorbing and electrolyzing water vapor transmitted from a sample used in an apparatus for rapidly determining the water vapor transmission rate through plastic films or like structures and the water content of solid, liquid or gaseous materials, the cell comprising; a hollow body defining an interior space, a removable closure adjacent said interior space for sealably closing said hollow body, a sample support disposed within said interior space, an electrolysis sandwich structure comprising a first electrode support and a first electrode and a second electrode support and a second electrode with a fibrous matrix impregnated with an electrically conductive water absorption material disposed electrically between said first and second electrode, one of said electrode supports and electrodes separating said fibrous matrix from said interior space and having at least one passageway providing open communication between said interior space and said fibrous matrix through which said water vapor is transported into said fibrous matrix, said cell having at least one first elongated hollow providing open communication between said interior space and the exterior of said cell and at least one second elongated hollow providing open communication between said interior space and the exterior of said cell and at least one second elongated hollow providing open communication between said fibrous matrix and the exterior of said cell through which oxygen and hydrogen generated by electrolysis of said water vapor in said fibrous matrix is transported, and a rubber septum for passing a quantity of water into said interior space from a location exterior of said interior space.

3,886,058

GAS SENSING ELECTRODE SYSTEM EMPLOYING HYDROPHILIC WICK

Gabriel G. Barna, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 30, 1973, Ser. No. 383,923
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 P **2 Claims**



2. An electro-chemical gas detection system, comprising:
a housing defining a chamber, said housing having a bottom wall provided with an aperture therein,
a body of a liquid electrolyte carried by said housing within the chamber defined thereby,
an elongated reference electrode rod in said housing and being partially immersed in said liquid electrolyte body but having at least one end thereof disposed outwardly of said liquid electrolyte body,
an elongated non-porous sensing electrode rod in said housing in spaced relation to said reference electrode rod and being partially immersed in said liquid electrolyte body but having both ends thereof disposed outwardly of said liquid electrolyte body,
one end surface of said non-porous sensing electrode rod comprising a sensing surface to which gas to be monitored is adapted to be exposed,
the end of said non-porous sensing electrode rod opposite from the end thereof on which said sensing surface is provided extending through the aperture in the bottom wall of said housing in liquid-tight sealed relation to the bottom wall of said housing,
cover means closing the top of said housing in liquid-tight sealed relation, said cover means including an inlet passageway in communication with said sensing surface of said non-porous sensing electrode rod for introducing a gaseous body into the interior of the chamber,
meter means electrically connected between said at least one end of said reference electrode rod and the end of said non-porous sensing electrode rod opposite from the end thereof on which said sensing surface is provided,
an elongated hydrophilic porous fiber wick extending transversely across said sensing surface of said non-porous sensing electrode rod and into partial immersion with said liquid electrolyte body for providing a small quantity of the liquid electrolyte across said sensing surface through capillary attraction and absorption by said porous fiber wick of the liquid electrolyte to complete an ohmic connection, said porous fiber wick having a relatively small diametral dimension as compared to the width of said sensing surface and covering only a minor portion of the area of said sensing surface, and
said cover means further including a gas-permeable membrane disposed in said inlet passageway in alignment with

said sensing surface and in spaced relation to said porous fiber wick.

3,886,059

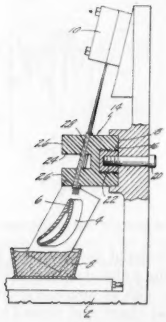
GUIDE FOR ELECTROCHEMICAL DRILLING

Walter E. Mikulski, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Division of Ser. No. 374,610, June 28, 1973, Pat. No. 3,842,480. This application June 25, 1974, Ser. No. 482,954

Int. Cl. B23p *1/12;* **B01k** *3/04;* **C23b** *5/70*

U.S. Cl. 204—224 M **5 Claims**



1. A guide to support electrodes for multiple electrochemical drilling including:

a base having a plurality of holes therein in predetermined relation to one another and all normal to the hole to be drilled by the electrode guided therein,

said base having a threaded fitting for attachment to a machine base, and

a plurality of dielectric tubes positioned in said holes for guiding the electrodes,

the inner diameter of the tubes being such as to guide the electrode therein and to permit axial movement of the electrode for the drilling operation.

3,886,060

METHOD FOR CATALYTIC CRACKING OF RESIDUAL OILS

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

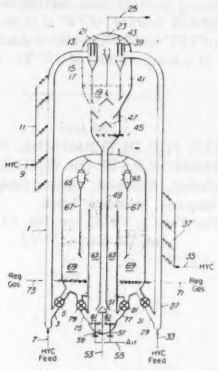
Filed Apr. 30, 1973, Ser. No. 355,821

Int. Cl. C01b *33/28;* **C10g** *11/18*

U.S. Cl. 208—120 **12 Claims**

1. A method for converting residual oils to lower boiling products which comprises,

passing hot crystalline zeolite catalyst particles to the lower portion of an elongated conversion zone, passing a recycle oil product of residual oil cracking to the lower portion of said conversion zone under conditions to form a suspension with said catalyst particles at a temperature of at least 1,000°F., passing said suspension through said conversion zone providing a recycle oil charge residence time in the range of 0.5 to about 4 seconds, combining a residual oil feed with said suspension in said conversion zone in an amount sufficient to quench said recycle oil conversion, passing the suspension comprising said residual oil feed through said conversion zone at lower temperature cracking conditions for an additional hydrocarbon residence time in the range of 0.5 to 6 seconds, cyclonically separating said suspension into a hydrocarbon phase and a catalyst phase and separately recovering said hydrocarbon phase and said catalyst phase.



3,886,061

TRIMETALLIC HYDROCARBON REFORMING PROCESS

Joseph Edouard Weisang, and Philippe Engelhard, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, France

Division of Ser. No. 234,875, March 15, 1972, Pat. No. 3,822,221, which is a continuation-in-part of Ser. No. 11,325, Feb. 13, 1970, Pat. No. 3,700,588. This application Dec. 14, 1973, Ser. No. 424,783

Claims priority, application France, Feb. 14, 1969, 69.03646; Mar. 24, 1971, 71.10459The portion of the term of this patent subsequent to Oct. 24, 1989, has been disclaimed.

Int. Cl. C10g *35/08*

U.S. Cl. 208—138 **2 Claims**

1. In a process for hydroreforming hydrocarbon feed in the presence of hydrogen at low temperatures, the improvement of which comprises: feeding said hydrocarbon feed over a catalyst comprising of a support of alumina of a specific surface of more than 15 m^2/g, of a pore volume of more than 0.1 cm^3/g and having acid sites, and of metals on the said support, said metals on said catalyst support consisting essentially of:

a. 0.02 to 2 percent of platinum, referred to the total weight of the catalyst;

b. 0.02 to 2 percent of iridium, referred to the total weight of the catalyst;

c. 0.02 to 2 percent of tin, referred to the weight of the catalyst.

3,886,062

METHOD AND APPARATUS FOR FRACTIONATING MULTI-COMPONENT FEEDS

Alfred M. Peiser, Rocky Hill, N.J., and Matthew J. De Pasquale, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 14, 1974, Ser. No. 432,913

Int. Cl. B01d *3/14;* **C10g** *7/00*

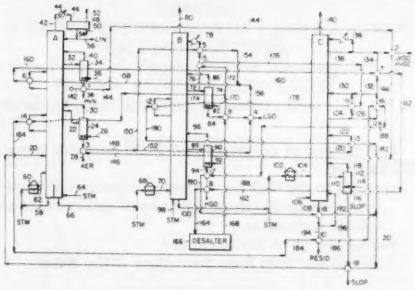
U.S. Cl. 208—354 **11 Claims**

1. In a crude oil distillation process arrangement comprising a pressured and a vacuum distillation zone, the improvement which comprises,

a. providing an intermediate pressure distillation zone between said pressured and said vacuum distillation zones in sequential arrangement,

b. passing a desalted crude oil preheated to a desired elevated temperature by indirect heat exchange with product streams recovered from the combination of distillation zone to a lower portion of said pressured distillation zone, recovering kerosene, heavy naphtha, light naphtha and lower boiling gaseous material separately from said pressure distillation zone above said crude oil charged thereto, recovering a residual oil fraction higher boiling than kerosene from a bottom portion of said pressure distillation zone,

c. heating said recovered residual oil fraction to a higher temperature than its recovered temperature and thereafter passing it to a lower portion of said intermediate pressure distillation zone; separating heavy gas oil, light gas oil and lower boiling material from a higher boiling

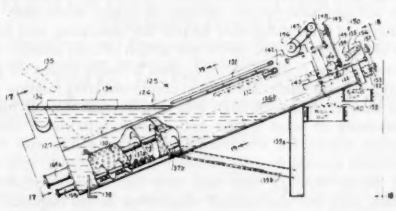


residuum material in said intermediate pressure distillation zone,

d. heating said residuum material to a higher temperature than its recovered temperature and thereafter passing it to a lower portion of said vacuum distillation zone; separating light and heavy vacuum gas oil boiling material, separating a slop oil fraction of reduced asphalt content separately from resid material in said vacuum distillation zone; partially cooling resid material recovered from the bottom of said vacuum distillation zone and returning a portion of the cooled resid to a lower portion of said vacuum distillation zone as quench material, and

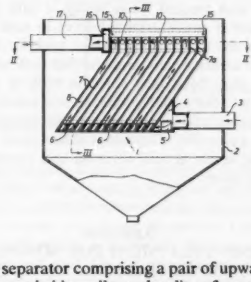
e. providing incremental reboiler heat to a bottom portion of said pressured distillation zone in an amount adequate to accomplish separation of kerosene and lower boiling component from the pressured distillation zone.

3,886,063
WET CONCRETE SEPARATOR
Reinhardt Friesz, 3635 S. Shaver St., Pasadena, Calif. 77504
Continuation-in-part of Ser. No. 1,372, Jan. 8, 1970, Pat. No. 3,695,427. This application Sept. 1, 1972, Ser. No. 285,892
Int. Cl. B03b *7/00*
U.S. Cl. 209—44 **31 Claims**



4. A classifying separator comprising a conveyor housing and a receiving and settling tank adapted to receive unpoured rock-gravel, sand and cement slurry in unhardened flowable mixture thereinto, said conveyor housing comprising a lower portion of said tank and extending upwardly from a rear end of said settling tank in inclined position and having therein parallel extending, first and second rotatable helix conveyors with the lower extremities thereof extending into said settling tank, a first outlet provided at the upper end of said conveyor housing for the outward delivery therethrough of rock-gravel from said conveyor housing, and a second outlet provided at the upper end of said conveyor housing for the outward delivery therethrough of said from said conveyor housing, screen means extending across said settling tank intermediate the length of said conveyor housing for inhibiting the settling into the rearward end of said settling tank of rock-gravel started upwardly by said first conveyor, separate means for the respective receipt of rock-gravel and of sand at delivery through respective outlets, and for respective transfer for further disposition, washing means for flushing cement slurry from the sand and rock-gravel being conveyed upwardly and to wash said cement slurry into said settling tank, said screen means defining a barrier to allow cement slurry to flow rearwardly into said settling tank while simultaneously inhibiting the flow of rock-gravel thereinto, said settling tank having an overflow provided in said rear end and an overflow receptacle means disposed to receive the overflow of cement slurry therefrom.

3,886,064
LAMELLAR SEPARATOR
Pentti Einari Kosonen, Saltsjo-Boo, Sweden, assignor to AB Gustavsbergs Fabriker, Germany
Filed Oct. 17, 1972, Ser. No. 298,412
Claims priority, application Sweden, Nov. 12, 1971, 14546/71
Int. Cl. B03b *3/30;* **B01d** *21/00*
U.S. Cl. 209—157 **1 Claim**



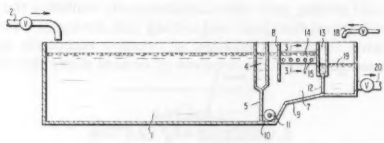
1. Lamellar separator comprising a pair of upwardly extending laterally spaced side walls, a plurality of spaced upwardly oriented lamellae extending transversely between said side walls and forming, in combination with said side walls, a plurality of separator channels, said lamellae disposed obliquely to the horizontal, said side walls having first openings at their lower ends and second openings at their upper ends, said first openings forming inlet openings into each of said channels and said second openings forming outlet openings from each of said channels so that the flow passes upwardly therethrough, a sedimentation basin enclosing said side walls and lamellae and arranged in combination with said side walls and lamellae for separating light impurities such as flocks in a sewerage treatment plant, wherein the improvement comprises regulating plates positioned on said side walls in front of said outlet openings, said regulating plates being adjustable in the vertical direction to provide a uniform distribution of the total flow through said separator channels and to provide a uniform circulating pattern in the individual said channels to compensate for poor alignment of the separator, the upper ends of said lamellae extending vertically upwardly from the remaining portions extending obliquely to the horizontal for reducing the speed of the flow through the upper part of said separator channels so that flow disturbances from said regulating plates are decreased, said regulating plates having apertures therethrough arranged to be vertically adjustably aligned opposite said outlet opening in said side walls and the vertical arrange-

ment of the upper ends of said lamellae increases the width of said separator channels so that said outlet openings in said side walls and said apertures in said regulating plates can be made as large as possible thus affording increased capacities in the lamellar separator.

3,886,065
WASTE WATER TREATMENT PLANT WITH BALANCED LOAD

Stanley E. Kappe, Washington, D.C., and Dick C. Heil, Silver Spring, Md., assignors to Kappe Associates, Inc., Rockville, Md.

Division of Ser. No. 233,521, March 10, 1972, abandoned. This application Feb. 15, 1974, Ser. No. 442,896
Int. Cl. C02c *1/02*
U.S. Cl. 210—15 **2 Claims**



1. A method of balancing the load of a waste water treatment plant which includes an aeration tank and a clarifier tank, comprising feeding waste water to the aeration tank at a flow rate that varies between a maximum and a minimum above and below a predetermined flow rate, withdrawing from the clarifier tank treated waste water at said predetermined flow rate from a predetermined level in said clarifier tank spaced below the top of said clarifier tank, accumulating and storing in the aeration tank and clarifier tank above said level waste water that flows into aeration tank in excess of that which flows into the aeration tank at said predetermined flow rate, withdrawing said waste water at said predetermined flow rate through a plurality of openings at said level, and maintaining the liquid levels in said aeration and clarifier tanks substantially the same.

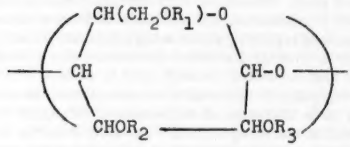
3,886,066
TANNIN TREATMENT FOR NON-POROUS SEMIPERMEABLE MEMBRANES

Carl Chen, Newark, and James Barry Ganci, Wilmington, both of Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.

Filed Nov. 6, 1972, Ser. No. 303,780
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **16 Claims**

1. A process for separating solvent from an aqueous mixture containing a solute other than aqueous tanning extracts, comprising contacting a nonporous semipermeable membrane selected from

a. A cellulose acetate polymer of the general formula:



wherein R_1, R_2 and R_3 are the same or different and are hydrogen, alkyl of one to eight carbon atoms or CR_4O wherein R_4 is alkyl of one to seven carbon atoms, and n is an integer sufficiently large to provide film forming weight,

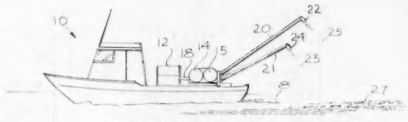
b. Sulfonated poly(phenylene ether), and

c. Sulfonated poly(arylene ether sulfone) with said mixture under permselective separation conditions, said membrane having been treated with a solution of a hydrolyzable tannin in an amount and under conditions which result in an initial reduction in solute passage through the membrane of at least 10%.

3,886,067
PROCESS FOR CONTROLLING OIL SLICKS

Salvatore W. Miranda, P. O. Box 5746, Carmel, Calif. 93921

Filed Feb. 3, 1970, Ser. No. 8,198
Int. Cl. C02b *9/02*; **E02b** *15/04*
U.S. Cl. 210—40 **15 Claims**



1. A method of coagulating oil slicks on water comprising the steps of:

applying to the slick an oleophilic organic resin semi-rigid to rigid foam containing a mixture of water soluble and oil soluble surfactants;

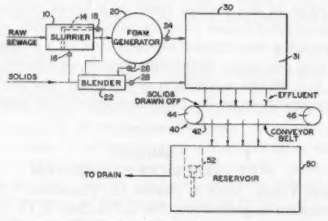
binding the oil on the foam; and

removing the foam from the surface of the water.

3,886,068
SEWAGE DISPOSAL SYSTEM

Robert E. Eron, 3375 34th Street, North, St. Petersburg, Fla. 33713

Continuation-in-part of Ser. No. 233,534, March 10, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 415,142
Int. Cl. B03d *1/02*
U.S. Cl. 210—44 **4 Claims**



1. A sewage disposal means for treating raw sewage, said system comprising: slurrier means for breaking up solids in the sewage into small particulate matter, connected to a source of raw sewage, said slurrier means including more than one withdrawal means disposed therein for separating said solids not effectively broken up by the action of said slurrier; said slurrier means comprising an output, foaming means for generating a foam interconnected in communicating relation with said slurrier means through said output; said slurrier means comprising at least a first and second withdrawal means, blender means for intermixing additional solids with foam produced by said foaming means interconnected to said slurrier means through both said first and second withdrawal means, said first and second withdrawal means disposed and configured in predetermined relation to said slurrier means whereby solid material of different dimensions is selectively transported to said blender means, a first foam output means interconnected between said foaming means and said blender means, whereby foam may be selectively transported to said blender means, a drain means for collecting output from said

blender and said foaming means, a second foam output means interconnected between said foaming means and drain means, blender output means interconnected between said blender means and said drain means; flow control means disposed in fluid communicating and regulating relation with said slurrier means, said foaming means, said blender means and said drain means; whereby sewage under treatment can be selectively directed to said drain means from its source, successively through said slurrier means and said foaming means or alternately, through said blender means dependent upon the existence of solids in said sewage being treated, said disposal means further including aerator means disposed in fluid receiving relation to said drain means, whereby effluent passing through said aerator means from said drain means is purified.

3,886,069

PROCESS FOR PURIFICATION OF AQUEOUS SODIUM CITRATE SOLUTIONS

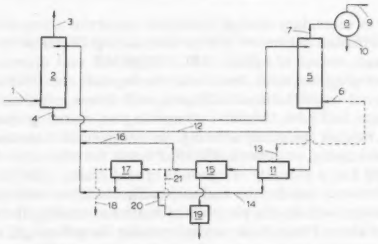
Olav Erga Trondheim, Eikveien, 7, 7000 Trondheim, Norway

Filed Nov. 19, 1973, Ser. No. 416,767

Claims priority, application Norway, Nov. 24, 1972, 4331/72

Int. Cl. C02b *1/20*

U.S. Cl. 210—46 **10 Claims**



1. A process for purification of an aqueous sodium citrate solution which has been used for absorption of sulphur dioxide and then subjected to a stripping operation to remove the majority of the absorbed sulphur dioxide, comprising the following steps:

A. said solution is evaporated at 80° – 105°C at approximately atmospheric pressure to smaller volume, sodium citrate seed is added thereto, and is kept at 25° – 35°C for at least half an hour to precipitate sodium citrate which is separated off, and

B. the solution remaining after the sodium citrate precipitated in step A has been separated off, is cooled to 15°C or lower to precipitate sodium sulphate which is separated off.

3,886,070

METHOD FOR COMBATTING POLLUTION USING A CHROMIUM COMPLEX

Jean Martineau, and Francois-Joseph Biechler, both of Paris, France, assignors to Seppic, Paris, France

Filed Feb. 16, 1973, Ser. No. 332,803

Claims priority, application France, Feb. 18, 1972, 72.05609

Int. Cl. B01d *11/00*

U.S. Cl. 210—47 **2 Claims**

1. A method of combating the pollution of waters by oily products by forming a paste of the oily products, which paste floats on the surface of the water and is removed therefrom by skimming, said method comprising the steps of:

a. preparing a product comprising a chromium complex anchored to solid particles of a metallic aluminosilicate wherein the chromium complex is coordinated to an acyclic carboxylic acid having at least 7 carbon atoms, by contacting for a period of about 15 minutes from about 5 to 20 parts by weight of solid particles of an aluminosilicate of less than 100 micron average particle size with 1 part by weight of an aqueous alcoholic solution containing from about 20 to 30% by weight of said coordinated chromium complex,

b. heating the mixture to dryness at a temperature of from about 100° to 120° C.,

c. distributing from 1 to 4 parts by weight of said dried product over 1 part by weight of said oily product floating on the surface of said waters whereby said oily product forms a paste floating on the surface of the waters,

d. removing said paste from the surface of the water by skimming it therefrom.

3,886,071

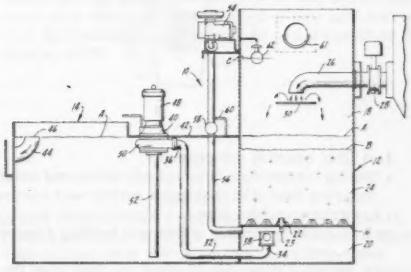
FILTER

Frank G. Weis, Kansas City, Mo., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Jan. 29, 1973, Ser. No. 327,381

Int. Cl. B01d *23/26*

U.S. Cl. 210—108 **6 Claims**



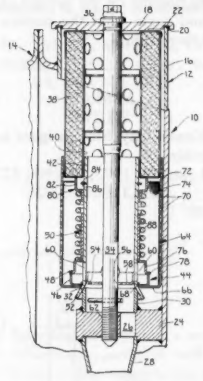
1. A filter for treating liquids, comprising: a filter compartment having a filter bed separating it into an upper inlet chamber and a lower underdrain chamber; an inlet pipe, having a control valve means associated therewith, communicating with said inlet chamber; a backwash storage compartment positioned adjacent said filter compartment; a connecting pipe having a first end extending into said underdrain chamber and a second end in communication with a backwash pump means; said pump means constructed and arranged to permit the flow of filtered liquid from said underdrain chamber through said connecting pipe to pass directly therethrough into said backwash storage compartment; blower means for delivering air through an air supply conduit into said underdrain chamber; control means including a level sensing switch means positioned within said inlet chamber, said control means constructed and arranged for sequentially closing said control valve means, activating said blower means for a period of time, activating said pump means for a period of time and reopening said control valve means, when the liquid in the inlet chamber reaches a predetermined level; said first end of said connecting pipe includes a float valve means associated therewith which permits the passage of liquid therethrough until the level of liquid within said underdrain chamber drops to the level of said float valve means; said air supply conduit communicates with said underdrain chamber at a level above said float valve means such that the air entering said underdrain chamber forces liquid within said chamber through said float valve means and said connecting pipe into said backwash storage compartment until the level drops to the level of said float valve means; and an effluent pipe associated with said backwash storage compartment for removal of filtered liquid therefrom to service.

3,886,072

FILTER RETAINER AND BYPASS VALVE ASSEMBLY

Joseph E. Dezelan; John A. Junck, and Neil W. Kroth, all of Joilet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 30, 1973, Ser. No. 355,474
Int. Cl. B01d *27/10*
U.S. Cl. 210—130 5 Claims



1. A filter assembly comprising:

a housing comprising a housing body and an end cover, and including fluid inlet and outlet means; said inlet means comprising an inlet pipe

an annular filter element within said housing adjacent the end cover;

fluid directing means for directing the fluid from the fluid inlet pipe through the filter element and comprising a tubular member having one end portion thereof surrounding and in contact with said inlet pipe, and the opposite end adjacent the filter element, said one end being flared;

valve means associated with said tubular member and comprising a tubular valving element movable to a first position away from the filter element so that the fluid directing means direct fluid from the fluid inlet pipe through the filter element, and movable away from the first position toward the filter element to allow fluid to flow from the fluid inlet means to the fluid outlet means, bypassing the filter element;

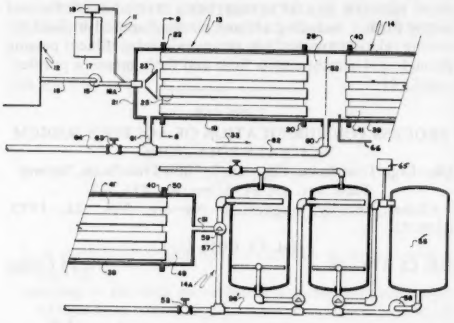
ring means slidably mounted about said tubular member adjacent said opposite end thereof, said tubular valving element; resilient means interposed the valving element and the ring means urging the valve means and the ring means towards opposite ends of said tubular member, with the valving element being urged about said tubular member, means associated with said valve seat member and said flared end of the tubular member to prevent the sliding of said valve seat member and said valving element off said tubular member, retaining means disposed on said tubular member adjacent said opposite end thereof to prevent said ring means from sliding off of the opposite end of said tubular member, the tubular member defining passage means to allow fluid in the tubular member to reach the valving element and valve seat member to subject them to fluid pressure introduced through the fluid inlet pipe to the filter element, the valving element and valve seat member being configured so that the valving element moves toward the filter element upon fluid pressure buildup in the filter element.

3,886,073

SEWAGE AND EFFLUENT TREATING SYSTEM

Raymond P. Briltz, P.O. Box 342, Grenfell, Saskatchewan, Canada

Continuation of Ser. No. 160,473, July 7, 1971, abandoned. This application Apr. 4, 1974, Ser. No. 457,794
Claims priority, application Canada, July 6, 1971, 117411
Int. Cl. B01d *21/08*; C02b *1/20*
U.S. Cl. 210—136 8 Claims



1. A secondary sewage treatment apparatus comprising in combination means to add a flocculating chemical to said sewage, means to agitate said sewage and said chemical to thoroughly mix same, and means to separate the flocculated material from the liquid effluent, said means to agitate said sewage and said chemical comprising an agitating module, said module including a casing, an intake header at one end of said casing, an outlet baffle chamber at the other end of said casing and a plurality of conduits in said casing communicating between said header and said baffle chamber, each of said conduits including a plurality of baffles extending from the walls thereof to agitate sewage passing therethrough, and a substantially horizontal perforated partition baffle spanning each of said conduits lengthwise and separating each of said conduits into a normal flow agitating portion above said partition baffle and a reverse flow cleaning portion below said partition baffle, said plurality of baffles being located in said normal flow agitating portion, and a hinged, effluent-flow-operated flap valve hinged on the discharge ends of each said conduits for closing off said normal flow agitating portions when effluent is flowing in a direction opposite to the normal direction of flow and for opening said normal flow agitating portion when said effluent is flowing in the normal direction of flow.

3,886,074

AIR DRIVEN ROTATING BIOLOGICAL CONTACTOR APPARATUS

David G. Prosser, River Hills, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 370,219, June 15, 1973, abandoned. This application June 4, 1974, Ser. No. 475,641
Int. Cl. B01d *21/00*
U.S. Cl. 210—150 14 Claims

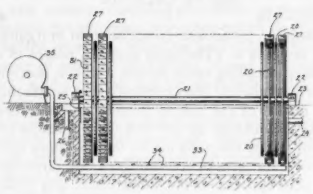
1. A biological wastewater treatment apparatus, comprising:

a treatment tank having a fluid inlet and a fluid outlet,

a generally circular rotating biological contactor assembly mounted for rotation about a horizontal axis and disposed in said tank for partial submergence in the wastewater in the tank,

a plurality of pockets arrayed along the length of said contactor assembly and disposed at the radially outer surfaces of said contactor assembly, said pockets having a depth which is a minor portion of the radius of said contactor assembly,

a source of oxygen containing gas under pressure, and
a gas conduit leading from said source of gas into said tank and having submerged openings disposed beneath the length of said contactor assembly,



said pockets each opening outwardly in a direction opposite to the direction of rotation of said contactor assembly to trap gas released froom said conduit.

3,886,075

FABRIC SOFTENING COMPOSITION CONTAINING A SMECTITE TYPE CLAY

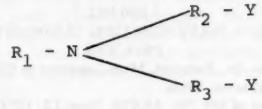
Lowell Watson Bernardino, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 337,331, March 2, 1973, abandoned. This application Apr. 16, 1973, Ser. No. 351,678

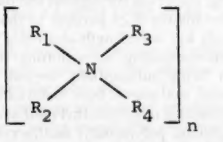
Int. Cl. D06m *13/00*

U.S. Cl. 252—8.75 **4 Claims**

1. A fabric softening composition comprising:
a. from about 2 to about 90% by weight of a smectite-type clay having an ion-exchange capacity of at least 50 meq/100 grams;
b. from about 1 to about 40% by weight of a substantially water-insoluble quaternary ammonium antistatic agent of the formula:



wherein R_1 and R_2 represent hydrocarbyl groups containing from about 10 to about 22 carbon atoms, R_3 and R_4 represent hydrocarbyl groups containing from 1 to about 4 carbon atoms, X is an anion and n is an integer from 1 to 3; and
c. from about 1 to about 40% by weight of a compatibilizing agent of the formula:



wherein R_1 represents an alkyl group containing from 1 to about 22 carbon atoms; R_2 and R_3 represent alkyl groups containing from 1 to about 10 carbon atoms or hydrogen, whereby not more than one of the groups R_2 and R_3 can be hydrogen; and Y represents $-CONH_2$; $-CON(R_4)_2$; or $-COOH$; wherein R_4 represents an alkyl group containing from 1 to about 4 carbon atoms or hydrogen.

3,886,076

PERLITE THERMAL INSULATION PRODUCT AND METHOD OF PRODUCING SAME

Joseph M. Venable, New Braunfels, Tex., assignor to Pamrod, Inc., McQueeny, Tex.

Filed Dec. 22, 1972, Ser. No. 317,693

Int. Cl. C04b *43/02*

U.S. Cl. 252—62 **12 Claims**

1. A method of forming a low density corrosion inhibiting thermal insulation product comprising the steps of:
a. Mixing a wet phase liquid product in a wet phase mixing zone by:
i) Adding about 35–52 percent water;
ii) Adding about 0.33–2.00 percent liquid silicone water repellency material to the water;
iii. Adding about 13.5–21.0 percent of metallic phosphate binder to the product of steps i) and ii);
b. Mixing and agitating in a dry phase mixing zone, about 20.5 to 32 percent expanded perlite having a bulk density from about 2–5 pounds per cubic foot; not more than 6 percent of at least one of sodium tetraborate and sodium silicate; and about 1.0–3.5 percent of an inorganic fiber;
c. Wetting substantially uniformly the product of step b) with the product of step a);
d. Placing the wetted product of step c) in a compression zone to form a desired article; and
e. Curing the molded product in a heating zone at a temperature of at least 500°F. for a period of time sufficient to heat the molded product throughout to a temperature of at least 480°F.

3,886,077

GARNET STRUCTURE FERRIMAGNETIC MATERIAL HAVING A SATURATION MAGNETISATION LESS THAN 1000 GAUSS FOR MICROWAVE APPLICATIONS

Jean Nicolas; Alain Lagrange, and Roland Sroussi, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 30, 1973, Ser. No. 346,245

Claims priority, application France, Mar. 31, 1972, 72.11633

Int. Cl. C04b *35/00*

U.S. Cl. 252—62.57 **6 Claims**

1. Ferrimagnetic polycrystaline garnet structure material having the general formula:

$$Y_{3-3x-z}Gd_{3x}Ca_z\ Fe_{5-5y-z}\ Al_{5y}\ Sn_z\ O_{12}$$

wherein
$0.6 \leq x \leq 0.8$
$0.02 \leq y \leq 0.12$
$0.2 \leq z \leq 0.4$
said material having a saturation magnetisation less than 1000 gauss.

3,886,078

N-BENZOYLSACCHARIN AS PEROXYGEN BLEACH ACTIVATOR

Frank Fred Loffelman, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 28, 1973, Ser. No. 336,655

Int. Cl. C11d *7/54*

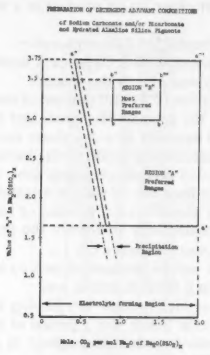
U.S. Cl. 252—102 **6 Claims**

1. A bleaching composition comprising hydrogen peroxide or a hydrogen peroxide-releasing compound and an activating amount of N-benzoylsaccharin.

3,886,079
DETERGENT COMPOSITIONS AND DETERGENT ADJUVANT COMBINATIONS THEREOF, AND PROCESSES FOR FORMING THE SAME

Oliver W. Burke, Jr., P.O. Box 2266, Fort Lauderdale, Fla. 33160

Filed Sept. 27, 1971, Ser. No. 184,059
Int. Cl. C11d *3/08, 3/10, 11/00*
U.S. Cl. 252—109 **21 Claims**



1. A process for preparing a detergent adjuvant combination which comprises:

a. forming an aqueous solution of water soluble alkali metal silicate,

b. adding to said solution sufficient reactant selected from the class consisting of carbon dioxide and alkali metal bicarbonate to form therewith a solution of electrolyte selected from the alkali metal carbonates and bicarbonates and a precipitate of alkaline silica pigment therein containing from 0.2 to 40% bound alkali by weight based on the silica of the pigment, and

c. recovering and essentially drying together the combination of said alkaline silica pigment and at least 25% dry basis, by weight, of the electrolyte resulting from step *b*).

20. A process for preparing a detergent adjuvant combination which comprises:

a. forming an aqueous solution of water soluble alkali metal silicate,

b. adding to said solution sufficient reactant selected from the class consisting of carbon dioxide and alkali metal bicarbonate to form therewith a solution of electrolyte selected from the alkali metal carbonates and bicarbonates with a precipitate of alkaline silica pigment therein containing from 0.2 to 40% bound alkali by weight based on the silica of the pigment, and

c. recovering and essentially drying together the combination of said alkaline silica pigment and at least 25% dry basis, by weight, of the electrolyte resulting from step (*b*), in combination, as a detergent adjuvant combination, said recovery including incorporating said adjuvant combination with detergent material selected from the class consisting essentially of the members of the following groups: Group (I) soaps; Group (II) synthetic anionic detergents; Group (III) non-ionic detergents; and combinations of two or more of said members; in a ratio in the range of 5:95 to 95:5 parts dry basis, by weight, based on the silica content as SiO_2 , thereby forming a detergent composition incorporating said detergent adjuvant combination, and

d. in which the detergent material comprises material selected from the sub-class consisting of the members of Groups (I) and (II) which is formed in the presence of the silica pigment by reaction of the corresponding free acid with alkalinity of the combination resulting from step (*b*).

3,886,080
CHELATING AGENTS COUPLED TO INORGANIC CARRIERS AND METHOD OF PREPARING

Gerald D. Schucker, Corning; Ken F. Sugarvara, Painted Post, and Howard H. Weetoll, Elmira, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 227,204, Feb. 17, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 394,119
Int. Cl. C02b *1/00*
U.S. Cl. 252—176 **4 Claims**

1. An insoluble composite comprising an inorganic carrier chemically coupled to a chelating agent by means of an intermediate silane coupling agent having a silicon portion and an organic portion wherein the coupling agent is attached to the carrier by means of the silicon portion and attached to the chelating agent through an azo linkage by means of the organic portion of the coupling agent, the chelating agent being selected from the group consisting of 8-hydroxyquinoline, dithizone, neocuproine, O-phenanthroline, and salicylaldoxime.

3,886,081
AQUEOUS BROMINE EMULSIONS

Gary W. Ceska, Coraopolis, Pa., assignor to ARCO Polymers, Inc., Glenolden, Pa.

Filed Dec. 6, 1972, Ser. No. 312,634
Int. Cl. C09k *3/00*
U.S. Cl. 252—182 **2 Claims**

1. An emulsion of from 15 to 30% bromine in water containing a stabilizer comprising 2 to 4% of an anionic surfactant selected from the group consisting of alkyl aryl sulfonates, organo phosphate esters, sulfated esters of fatty acids, sodium dodecyl diphenyl ether disulfonates, dialkyl esters of succinic acid, and dialkylsulfosuccinates and mixtures thereof.

3,886,082
CERENKOV WAVE-SHIFTING COMPOSITION AND PROCESS

Mark Hyman, Jr., Belmont, Mass., assignor to Pilot Chemicals, Inc., Watertown, Mass.

Continuation of Ser. No. 45,920, June 12, 1970, abandoned. This application Mar. 6, 1972, Ser. No. 232,299
Int. Cl. G01t *1/22*
U.S. Cl. 252—301.2 R **9 Claims**

1. A Cerenkov counter medium composition consisting essentially of a base of plastic Cerenkov-radiating light-transmitting material solid at room temperature and of inherent negligible or readily quenchable scintillation characteristics and containing, dispersed throughout the base material, a qunatity from substantially 0.25 percent to thousandths of a percent of relatively low wavelength-absorbing and relatively higher wavelength-re-emitting wave-shifting fluor material, said composition being substantially devoid of additional scintillating material, said plastic base material being selected from the group consisting of polymethyl methacrylate, polycyclo hexyl methacrylate, polyisobutyl methacrylate, their copolymers, polyvinyl toluene, polystyrene, and glass, said fluor being selected from the group consisting of bis-(o-methylstyryl) benzene, p-Bis-[2-(5-phenyloxazolyl)]-benzene, dimetnyl p-Bis[2-(5-phenyloxazolyl)]-benzene, 1,1′, 4,4′, -tetraphenylbutadiene, phenylbiphenylyloxadiazole-1,3,4, bis-(phenylstyryl) benzene,Diphenylanthracene, and perylene.

3,886,083
SAFETY INKS AND DOCUMENTS

Herbert Laxer, Franklin Square, N.Y., assignor to American Bank Note Company, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,409

Int. Cl. 283 *8 R;* **C09k** *1/00;* **B44f** *1/12;* **B42d** *15/00*

U.S. Cl. 252—301.2 R **2 Claims**

1. A printing ink consisting essentially of coloring matter and a vehicle soluble in water and lower alcohols and lower ketones, said vehicle consisting essentially of glycerine, sorbitol and water, the glycerine being present in an amount in the range 10–30% by weight based on said vehicle, the remaining percentages of sorbitol and water having a weight ratio of about 4:1, said coloring matter including a dye soluble in lower alcohols and lower ketones wherein said lower alcohols and said lower ketones contain not more than 8 carbon atoms per molecule, and a fluorescent pigment which is non-bleachable, insoluble in water and no more than very slightly soluble in said lower alcohols and lower ketones.

2. A printed document comprising:

1. an area adapted to be writted upon and sensitive to attempted alteration of written material thereon by either solution, bleaching or erasure;
2. said area having a background of printed elements including a pattern printed in an ink consisting essentially of coloring matter and a vehicle soluble in water and lower alcohols and lower ketones;
   a. said vehicle consisting essentially of glycerine, sorbitol, and water, the glycerine being present in an amount in the range 10–30% by weight based on said vehicle, the remaining percentages of sorbitol and water having a weight ratio of about 4:1;
   b. said color matter including:
      i. a dye soluble in lower alcohols and lower ketones, wherein said lower alcohols and said lower ketones contain not more than eight carbon atoms per molecule, said dye being bleachable and soluble in water, said dye being at least partly removed by solution or bleaching, and thereby changing the color of the background in response to attempted alteration of written material by solution or bleaching techniques; and
      ii. a fluorescent pigment which is non-bleachable, insoluble in water, and no more than very slightly soluble in said lower alcohols and lower ketones, said pigment having its fluorescence enhanced by removal of the dye during solution or bleaching, and being at least partly removed by erasure, thereby changing the color and flourescent intensity of the background, when viewed under ultraviolet light, in response to attempted alteration of written material by erasure.

3,886,084
MICROENCAPSULATION SYSTEM

Anthony E. Vassiliades, Deerfield, Ill., assignor to Champion International Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 583,046, Sept. 29, 1966, abandoned. This application Aug. 23, 1971, Ser. No. 174,045

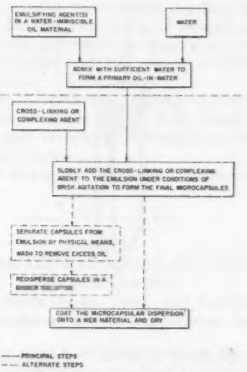
Int. Cl. B01j *13/02;* **B44d** *1/02*

U.S. Cl. 252—316 **24 Claims**

1. A process for the formation of microcapsules having non-proteinaceous walls, in the absence of coacervation, which comprises the steps of:

A. forming a primary oil-in-water emulsion, which emulsion comprises a water-immiscible oily material dispersed in the form of microscopic droplets in a colloidal solution of a non-proteinaceous, polymeric emulsifying agent having about the same hydrophil-lipophil balance as the oily material, said emulsifying agent being selected from the group consisting of polyvinyl alcohol, methylcellulose, a copolymer of an ethylenically unsaturated monomer and maleic anhydride, and guar gum; and

B. forming an impermeable coating around said dispersed oil droplets solely by providing to the emulsion a compound different from said emulsifying agent and reactive therewith to form an impermeable coating, said compound selected from the group consisting of an aldehyde


EMULSIFYING AGENT(S) IN A WATER-IMMISCIBLE OIL MATERIAL
WATER
ADMIX WITH SUFFICIENT WATER TO FORM A PRIMARY OIL-IN-WATER
CROSS-LINKING OR COMPLEXING AGENT
SLOWLY ADD THE CROSS-LINKING OR COMPLEXING AGENT TO THE EMULSION UNDER CONDITIONS OF BRISK AGITATION TO FORM THE FINAL MICROCAPSULES
SEPARATE CAPSULES FROM EMULSION BY PHYSICAL MEANS, WASH TO REMOVE EXCESS OIL
REDISPERSE CAPSULES IN A
COAT THE MICROCAPSULAR DISPERSION ONTO A WEB MATERIAL AND DRY
PRINCIPAL STEPS
ALTERNATE STEPS

monomer, polyvinyl alcohol, gum tragacanth, ethanolamine, ethylene diamine, a borate, and methylcellulose under conditions of brisk agitation, said compound reacting with said non-proteinaceous emulsifying agent so as to form a non-proteinaceous impermeable coating around said dispersed oil droplets.

3,886,085
PROCESS FOR PRODUCING FINE OIL-CONTAINING MICROCAPSULES HAVING STRONG PROTECTIVE SHELLS AND MICROCAPSULES PRODUCED THEREBY

Masataka Kiritani; Hiroharu Matsukawa; Akio Watanabe, and Hitoshi Imamiya, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Japan

Filed Aug. 24, 1972, Ser. No. 283,470

Claims priority, application Japan, Aug. 31, 1971, 46-66757

Int. Cl. B01j *13/02;* **B44d** *1/02*

U.S. Cl. 252—316 **11 Claims**

1. A process for producing fine oil containing microcapsules having strong protective shells which comprises dissolving in an oily liquid a polyisocyanate adduct having a free isocyanate group, said adduct having both an oleophilic group and a hydrophilic group, said polyisocyanate adduct being an adduct of hexamethylene diisocyanate and trimethylolpropane, an adduct of tolylenediisocyanate and trimethylolpropane, or a xylylene diisocyanate adduct, dispersing or emulsifying said oily liquid containing said polyisocyanate adduct in a polar solvent, adding a polyamine or a polyamine adduct having a free amino group to said polar solvent, and polymerizing polyisocyanate adduct in said oily liquid.

3,886,086
METHOD OF PRODUCING GEL SPHERES AND GELATION APPARATUS

Malcolm Patrick Simpson, Didcot, and Claude Lewis Stockwell, Newbury, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed June 12, 1972, Ser. No. 261,958

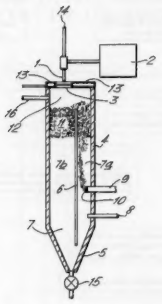
Claims priority, application United Kingdom, June 24, 1971, 29781/71

Int. Cl. B01j *13/00*

U.S. Cl. 252—317 **4 Claims**

1. A method of producing gel spheres comprising introducing droplets of material to be gelled into a column, causing the

droplets to make contact with a gaseous reagent in a region at an upper part of the column, and causing the droplets to contact a liquid reagent in a region at a lower part of the column, the fall of the droplets passing down the upper part



of the column being retarded by a layer of foam provided above the surface of the liquid reagent in the lower part of the column such that the droplets are not disrupted or substantially distorted on contacting the surface of the liquid reagent in the lower part of the column.

3,886,087

PROCESS FOR MAKING AN IMPROVED SOAP POWDER

Jessie Mae Terry, 688 Rockaway Ave., Brooklyn, N.Y. 11212

Filed June 21, 1973, Ser. No. 372,247

Int. Cl. C11d *9/16, 13/20*

U.S. Cl. 252—370 **4 Claims**

1. A process for making a soap powder, consisting essentially of dissolving 10 to 16 parts by weight of sodium hydroxide in 64 to 128 parts by weight water to form an aqueous sodium hydroxide solution, heating and stirring said solution while dissolving 80 to 105 parts by weight of lard therein followed by addition of 8 to 30 parts by weight of sodium tetraborate and 1 to 5 parts by weight coconut oil thereto, heating the resulting admixture with stirring for a period of from about two to about six hours to saponify the mixture, allowing the saponifying mixture to cool to room temperature and to stand at room temperature for a period of from two to four days, and forming the soap product thus obtained into a powder, the glycerine formed during the saponification being retained in the final soap product.

3,886,088

PROCESS FOR THE PREPARATION OF A GRANULAR ACTIVATED CARBON, AND GRANULAR ACTIVATED CARBONS PRODUCED THEREBY

Geert J. DeJong, Boekelo, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed July 30, 1973, Ser. No. 383,668

Claims priority, application Netherlands, Aug. 3, 1972, 7210632

Int. Cl. C01b *31/08*

U.S. Cl. 252—422 **4 Claims**

1. A process for preparing an activated carbon which comprises reacting at a temperature of from −20°C to +300°C cut up or ground synthetic or natural rubber with a member selected from the group consisting of sulphur, sulphuric acid, sulphur trioxide, chlorosulphonic acid and sulphuryl chloride in an amount of 0.05 to 12 parts by weight per part by weight of the rubber and thereafter heating the resulting product at a temperature of 350° to 1000°C until a granular activated carbon is obtained.

3,886,089

DILITHIO ALKANE CATALYST COMPOSITIONS AND METHOD FOR THE PREPARATION THEREOF

William Novis Smith, Jr., Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.

Filed Nov. 14, 1973, Ser. No. 415,729

Int. Cl. C07f *1/02*

U.S. Cl. 252—429 R **7 Claims**

1. A method for the preparation of dilithioalkane catalyst compositions which comprises: simultaneously reacting an alkyl monohalide and a hydrocarbyl dihalide with powdered lithium in a hydrocarbon solvent under an inert atmosphere at a temperature in the range from about 10°C. to about 100°C., and separating the resulting precipitate containing the dilithioalkane catalyst from the liquid portion of the reaction mixture; the molar ratio of said alkyl monohalide to said hydrocarbyl dihalide being in the range from about 0.3 to about 4:1; said powdered lithium being employed in just less than the stoichiometric amount to react with all of said alkyl monohalide and hydrocarbyl dihalide; said hydrocarbyl dihalide being selected from the group consisting of 1,4-dichlorobutane and hydrocarbyl dihalides having a hydrocarbyl radical selected from the group consisting of straight chain alkyl, cycloalkyl and aralkyl radicals containing from 5 up to about 30 carbon atoms in the alkyl chain, and having two halide atoms which may be the same or different selected from the group consisting of the iodide, bromide and chloride atoms, said halide atoms being attached to the alkyl radical and being at least 5 carbon atoms apart; said alkyl monohalide having an alkyl radical selected from the group consisting of primary and secondary alkyl radicals containing from 3 to about 20 carbon atoms, and a halide atom selected from the group consisting of iodide, bromide and chloride, and forming an alkyl lithium compound soluble in the reaction mixture.

3,886,090

NICKEL AND COBALT CATALYSTS INCLUDING A GROUP IIA AND VIA COMPONENT

Brent J. Bertus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 230,077, Feb. 28, 1972, Pat. No. 3,784,527. This application Sept. 20, 1973, Ser. No. 399,166

Int. Cl. B01j *11/74, 11/82*

U.S. Cl. 252—432 **25 Claims**

9. A catalyst composition consisting essentially of a calcined admixture of (I) cobalt or nickel oxide, compound convertible to the oxide on calcination, sulfate, selenate, or tellurate, and (II) beryllium, magnesium, calcium, strontium, or barium, oxided, compound convertible to the oxide on calcination, sulfate, selenate, or tellurate; further containing a support, wherein in said catalyst composition said cobalt or nickel represents about 20 to 85 weight percent, said Group IIA represents about 1 to 30 weight percent, and said sulphur, selenium or tellurium, represents about 1 to 40 weight percent, exclusive of said support.

10. The catalyst composition according to claim 9 wherein said support is silica, alumina, boria, titania, zirconia, mixtures thereof, or combinations thereof.

3,886,091

CATALYSTS FOR OXIDATIVE DEHYDROGENATION

Brent J. Bertus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 225,284, Feb. 10, 1972, Pat. No. 3,793,391. This application Oct. 24, 1973, Ser. No. 409,094

Int. Cl. B01j *11/74, 11/22, 11/82*

U.S. Cl. 252—432 **15 Claims**

1. A composition of matter consisting essentially of a calcined admixture of (I) cobalt oxide, compound of cobalt convertible to the oxide on drying of calcining, or the sulfate, (II) tin oxide, compound of tin convertible to the oxide on drying or calcination, or sulfate, and (III) a Group IIA metal oxide, compound convertible to a Group IIA oxide on calcina-

tion, or sulfate, such that in said calcined composition of matter cobalt represents about 10 to 75 weight percent, tin represents about 1 to 50 weight percent, and Group IIA metal represents about 0.5 to 60 weight percent.

4. The catalyst composition according to claim 1 wherein further is included in said catalyst composition a support, and said support is one or more of silica, boria, titania, and zirconia.

3,886,092

PROCESS FOR PRODUCING UNSATURATED CARBOXYLIC ACIDS

Masahiro Wada, Ikeda; Isao Yanagisawa, Osaka; Michikazu Ninomiya, Kobe, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 190,661, Oct. 19, 1971, Pat. No. 3,833,649. This application Sept. 12, 1973, Ser. No. 396,474The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.

Int. Cl. B01j *11/06*

U.S. Cl. 252—443 **8 Claims**

1. A catalyst adapted for the production of unsaturated carboxylic acids through the vapor phase oxidation of unsaturated aldehydes comprising a catalytic oxide supported on an inert carrier, said catalytic oxide consisting essentially of the recited metal elements in the atomic ratio Mo:V:Cu:Cr:W of 12:2–14:1–6:0–4:0–12 with the proviso that Cr + W is not O, said inert carrier having a surface area not greater than 2 m^2/g and a porosity of 30 to 65%, at least 90% of the pores having a pore diameter in the range of 50 to 1,500 microns.

3,886,093

ACTIVATED CARBON WITH ACTIVE METAL SITES AND PROCESS FOR PRODUCING SAME

Mitchell S. Dimitri, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,844

Int. Cl. C01b *31/08*

U.S. Cl. 252—447 **9 Claims**

1. A process for producing activated carbon containing active metal sites which comprises:

a. mixing a non-sulfonated aqueous lignate solution with an aqueous solution containing a transition metal salt at a mol ratio of 2:1 to 1:1 metal salt to lignate to thereby precipitate a transition metal lignate;

b. recovering said transition metal lignate precipitate;

c. drying said recovered transition metal lignate precipitate;

d. carbonizing said transition metal lignate precipitate at a temperature between 700°F. and 1,800°F.; and

e. activating said carbonized transition metal lignate at a temperature between 1,400°F. and 1,950°F.

2. The process of claim 1 wherein said lignin is alkali lignin.

3. The process of claim 1 wherein said lignin is a hexamethylene tetramine modified lignin.

3,886,094

PREPARATION OF HYDROCARBON CONVERSION CATALYSTS

Joseph Michael Pilato, Silver Spring; John Storey Magee, Jr., Cooksville, and Edwin Wolf Albers, Annapolis, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 22, 1972, Ser. No. 317,606

Int. Cl. B01j *11/40*

U.S. Cl. 252—451 **5 Claims**

1. A process for preparing crystalline alumino silicate containing catalysts which comprises:

a. forming a zeolite precursor reaction mixture containing silica, alumina, sodium hydroxide and water and crystallization initiating amorphous silica-alumina nucleation centers having a particle size below about 0.1 micron;

b. heating said reaction mixture to a temperature of from about 90° to 110°C. for about 15 to 120 minutes to produce about 15 to 100% of the crystalline zeolite theoretically available to said reaction mixture;

c. diluting said reaction mixture with sufficient water to yield a sodium silicate solution concentration of from about 3 to 7% by weight SiO_2 in said reaction mixture;

d. gelling said reaction mixture with a gelling mixture selected from the group consisting of mineral acids, CO_2, aluminium salts and mixtures thereof to produce an amorphous hydrogel composite having crystalline zeolite dispersed therein;

e. ammonium exchanging said composite to lower the Na_2O content thereof to below about 1% by weight;

f. exchanging said ammonium exchanged product with a rare earth salt solution;

g. washing and drying said composite to produce a particulate catalyst.

3,886,095

CATALYST FOR THE REDUCTION OF AUTOMOBILE EXHAUST GASES

James A. Ford, North Haven, Conn., and Sheldon H. Butt, Godfrey, Ill., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 342,271, March 16, 1973, Pat. No. 3,810,754. This application Nov. 12, 1973, Ser. No. 414,783

Int. Cl. B01j *11/06, 11/22*

U.S. Cl. 252—455 R **17 Claims**

1. A composite catalyst for the reduction of automobile exhaust pollution comprising:

A. a nickel alloy substrate containing from 2 to 6% aluminum, from 0.5 to 4% silicon, from 0.001 to 6% chromium, from 0.001 to 0.4% manganese, from 0.001 to 1% magnesium, balance essentially nickel; and

B. a surface layer of copper-nickel alloy on said substrate, having a composition consisting essentially of from 10 to 50% copper and from 50 to 90% nickel, said surface layer having a thickness of from 100 A to 0.05 inches.

3,886,096

OXIDATION AND AMMOXIDATION CATALYST

Tao P. Li, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1973, Ser. No. 320,372

Int. Cl. B01j *11/22*

U.S. Cl. 252—456 **6 Claims**

1. A catalyst system comprising the elements antimony, uranium, iron and tungsten in a catalytic active oxidized state represented by the formula:

$$Sb_aU_bFe_cW_dO_e$$

wherein A is 1 – 10, b is 0.01 – 1, c is 0.01 to 1, d is 0.001 to 0.1 and e is a number taken to satisfy the average valences of the Sb, U, Fe and W in their catalytic active oxidation states, said catalyst system being formed by heating oxides or sulfates of said elements at a temperature in the range of from about 500°C. to 1,150°C. for a time sufficient to form said catalytic active oxidation states.

3,886,097

METHOD FOR MAKING A LOW AVALANCHE VOLTAGE METAL OXIDE VARISTOR

Arthur M. Hossenlopp, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1973, Ser. No. 414,814

Int. Cl. H01c *7/10, 17/00*

U.S. Cl. 252—519 **5 Claims**

1. A method of making nonlinear metal oxide resistors with low avalanche voltage characteristics comprising the steps of: forming a uniform mixture of nonlinear resistor metal oxide powders for pressing into a predetermined shape,

isostatically pressing said mixture under a pressure of about 10,000 – 20,000 pounds per square inch to form an elongated body,

firing said elongated body at a temperature of about 2000° C. to 2300° C. for about 1 - 3 hours to produce a coherent mass having a predetermined nonlinear voltage-ampere characteristic,

transversely sawing said elongated body into a plurality of thin discs, each of which has substantially flat and parallel opposite major faces as formed that are suitable for attachment of electrodes and has a thickness less than about 0.05 inch commensurate with a predetermined avalanche voltage desired, and

attaching electrodes to said opposite major faces of said discs to form a plurality of discrete nonlinear metal oxide resistors that avalanche at a predetermined voltage below about 50 volts.

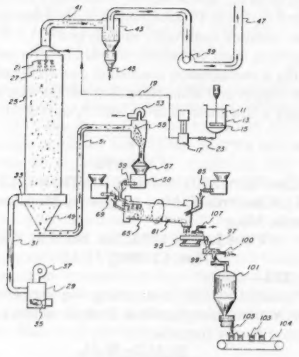
3,886,098
MANUFACTURE OF FREE FLOWING PARTICULATE DETERGENT COMPOSITION CONTAINING NONIONIC DETERGENT

Walter A. DiSalvo, North Arlington; Edward J. Kenney, Bernardsville, and Frank R. Smith, Jr., Plainfield, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 124,111, March 15, 1971, Pat. No. 3,838,072. This application Apr. 15, 1971, Ser. No. 134,324The portion of the term of this patent subsequent to Sept. 20, 1988, has been disclaimed.

Int. Cl. C11d *1/22, 1/83, 11/00*

U.S. Cl. 252—540 **12 Claims**



1. A method of producing a particulate detergent composition which comprises making inorganic salt-containing base particles comprising, on a detergent composition weight basis, at least 5 percent of sodium carbonate, sodium bicarbonate or sodium sesquicarbonate, at least 5 percent and less than 30 percent of sodium silicate, having $Na_2O:SiO_2$ ratio of 1:1.6 to 1:3.4, less than 15 percent of soluble higher alkyl benzene sulfonate detergent, less than 4 percent of nonionic detergent and less than 0.5 percent of sodium carboxymethyl cellulose, with the components of the base particles being such that the subsequently mentioned nonionic detergent is readily sorbed thereby, and distributing over the surfaces of the particles, while they are in motion, from 2 to 20 percent by weight of the detergent composition of a higher alkoxy poly-lower alkoxy lower alkanol containing nonionic detergent wherein said higher alkoxy contains from 10 to 18 carbon atoms, said lower alkoxy and lower alkanol contains from 2 to 3 carbon atoms, the total number of carbon atoms in said poly lower alkoxy lower alkanol being from 20 to 30.

3,886,099
WATER SOLUBLE FLUX REMOVER

Robert M. Hall, Portland, Oreg., assignor to Griffin Bros., Inc., Portland, Oreg.

Continuation of Ser. No. 234,403, March 13, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 414,724

Int. Cl. C11d *3/30*

U.S. Cl. 252—548 **9 Claims**

1. A water soluble solution for removing soldering flux from circuit boards consisting essentially of:

a glycol ether selected from the group consisting of ethylene glycol mono methyl ether, ethylene glycol ethylether, ethylene glycol mono butyl ether, diethylene glycol mono methyl ether, diethylene glycol mono ethyl ether and diethylene glycol mono butyl ether and mixtures thereof;

an amine selected from the group consisting of triethanol amine, diethanol amine, monoethanol amine and morpholine;

an organic acid selected from the group consisting of citric acid, gluconic acid and hydroxyacetic acid, there being at least about 3 mols of said amine present for each mol of said organic acid;

said glycol ether, amine and organic acid being dissolved in water to form a concentrate and being present in said concentrate in proportions which, upon dilution of said concentrate with water, will provide a washing solution containing by weight approximately 1 to 3% of said glycol ether, 1 to 3% of said amine and 0.18 to 0.56% of said acid.

3,886,100
METHOD OF MANUFACTURING POLYMER PARTICLES HAVING UNIFORM CROSS-LINKING AND EXPANDED SHAPED ARTICLES OBTAINED THEREFROM

Yoshizo Yasuda; Itaru Hatano; Yasuyuki Suganuma, and Tomohumi Kameo, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 237,967, March 24, 1972, abandoned. This application June 28, 1974, Ser. No. 484,253

Claims priority, application Japan, Mar. 25, 1971, 46-17713; Mar. 25, 1971, 46-17714; Mar. 25, 1971, 46-17715

Int. Cl. C08f *47/10, 27/00, 29/04*

U.S. Cl. 260—2.5 B **14 Claims**

1. A method of manufacturing polymer particles having uniform cross-linking comprising the steps of suspending in water particles of polyolefin resin, surface active agent, organic peroxide cross-linking agent, and inorganic metallic salt, and heating said suspension system to a temperature sufficient to cause penetration of said cross-linking agent into said particles, and cross-linking reaction.

3,886,101
PHENOLIC ADHESIVES

Vincent F. Felicetta, and Donald E. Wenzel, both of Bellingham, Wash., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed July 8, 1974, Ser. No. 486,414

Int. Cl. C08h *5/02;* **C07g** *1/00;* **B32b** *27/42*

U.S. Cl. 260—17.5 **19 Claims**

1. A thermosetting phenol-aldehyde adhesive composition comprising a water-soluble phenol-aldehyde resin intermixed

with a polymerized lignosulfonate in an amount sufficient to improve the assembly time of the adhesive, said polymerized lignosulfonate being a lignosulfonate reacted with a sufficient amount of a cross-linking agent selected from the group consisting essentially of aliphatic and heterocyclic aldehydes having up to 6 carbon atoms, epichlorohydrin, epibromohydrin, and poly-epoxides having not more than 10 carbon atoms to polymerize the lignosulfonate to the extent that from 30 to 80 percent of the polymerized lignosulfonate is insoluble in a 5 percent sodium carbonate aqueous solution.

3,886,102

RAPID SETTING POLYURETHANES FROM DIOLS AND POLYISOCYANATES PREPARED IN THE PRESENCE OF A MIXTURE OF LIQUID MODIFIERS

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 358,245, May 7, 1973, Pat. No. 3,801,532, which is a continuation-in-part of Ser. No. 205,697, Dec. 7, 1971, abandoned. This application Dec. 7, 1973, Ser. No. 422,802

Int. Cl. C08g *22/16*

U.S. Cl. 260—18 TN **20 Claims**

1. A rigid, non-cellular composition having a density of at least about 1 gram/cc which is demoldable within about 5 minutes after admixture of the components of the composition which is the reaction product of a polyurethane-forming composition comprising

A. a dihydroxyl-containing compound having a hydroxyl equivalent weight of less than about 250;

B. an organic polyisocyanate having an NCO functionality of at least about 2.5;

C. a liquid modifier compound having an atmospheric boiling point of at least about 150°C, with the proviso that a hydroxyl-containing halogenated aliphatic compound when employed as a modifier can have an atmospheric boiling point below 150°C, and which moderates the reaction between components (A), (B), and (D) without substantial reaction therewith, except when a hydroxyl-containing halogenated aliphatic compound is employed it can react with the polyisocyanate, said modifier consisting of a mixture, in any proportion, of at least two members selected, in any combinations, from the group consisting of

1. a fatty acid or fatty oils,
2. organic phosphates, phosphites or phosphonates,
3. cyclic polyethers,
4. aromatic compounds free from ester groups or partially hydrogenated aromatic compounds free from ester groups,
5. halogenated aliphatic compounds failing above about 150°C,
6. hydroxyl-containing halogenated aliphatic compounds falling below about 150°C,
7. cyclic sulfones,
8. organic carbonates, and
9. esters of carboxylic acids, and

D. an organometallic catalyst;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1, the quantity of component (C) is from about 10 to about 50 percent by weight of the combined weight of components (A), (B) and (C) with the proviso that when component (C) consists of a mixture of (C-5) and (C-6) the quantity employed is from about 0.2 to about 50; with a further proviso that whenever component (C) contains a hydroxyl-containing halogenated aliphatic compound with either has a boiling point below about 150°C or an OH equivalent weight below about 500, then the quantity of such compound or compounds is not to exceed about 10 percent by weight of the combined weight of Components (A), (B) and (C); and component (D) is present in quantities of from about 0.1 to about 10 percent by weight of the combined weight of components (A), (B) and (C).

3,886,103

METHOD FOR COATING METAL SUBSTRATE WITH A COMPOSITION CONTAINING VINYLIDENE FLUORIDE POLYMER OR VINYL FLUORIDE POLYMER

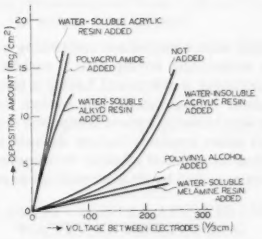
Shun Koizumi, Toyonaka; Takeshi Suzuki, Kyoto, and Chuzo Okuno, Takatshki, all of Japan, assignors to Daikin Kogyo Co. Ltd., Japan

Continuation of Ser. No. 126,062, March 19, 1971, abandoned. This application Sept. 11, 1973, Ser. No. 396,307

Claims priority, application Japan, Mar. 19, 1970, 45-023979

Int. Cl. C09d *3/78, 5/24*

U.S. Cl. 260—22 CB **13 Claims**



1. A coating composition for electro-deposition which comprises 1–30 percent by weight of a powder of a vinylidene fluoride polymer or a vinyl fluoride polymer containing not less than 75 percent percent by weight of vinylidene fluoride or vinyl fluoride monomer units, said powder having a particle size of 0.1 to 100 microns, a mixture of a water soluble organic solvent system capable of forming a film of the said polymer and water wherein the ratio of the organic solvent to water is from 20 : 80 to 90 : 10 by weight and a water-soluble resin, which resin dissociates and is ionized in water and is selected from the group consisting of an acrylic acid resin, an alkyd resin and an acrylic amide resin, said resin being used in an amount of 0.1 to 30 percent by weight of the said polymer.

3,886,104

STABILIZED POLYESTER COMPOSITIONS

Willem F. H. Borman, and Eugene P. Reilly, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

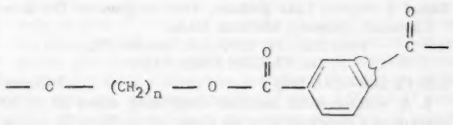
Filed Jan. 5, 1973, Ser. No. 321,267

Int. Cl. C08g *17/00, 51/58*

U.S. Cl. 260—22 EP **24 Claims**

1. A stabilized thermoplastic composition comprising

i. a high molecular weight linear polyester resin normally tending to undergo thermal scission, said resin having repeating units of the general formula



wherein *n* is a whole number of from 2 to 10 and

ii. a stabilizing quantity of an organic compound containing only carbon, hydrogen and oxygen and having at least two internal epoxide groups.

3,886,105
POLYOLEFIN COMPOSITION AND USE OF SAME IN ALKALINE SOLUTIONS

Henry G. Schutze, and Hulen L. Wilder, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 4, 1972, Ser. No. 278,143
Int. Cl. C08f *19/14*
U.S. Cl. 260—23 H **15 Claims**

1. Polyolefin resin composition comprising a solid polymer of an alpha monoolefin having 2 to 8 carbon atoms in the molecule containing a compound having a stearate radical a stearate radical unassociated with barium cation and an amount of a water soluble barium compound capable of forming sufficient water insoluble barium stearate soaps with the stearate radical in aqueous alkaline environments to prevent foaming therein caused by stearate radicals unassociated with barium.

3,886,106
STABILIZATION OF POLYBUTADIENE RESIN

Delmar F. Lohr, Jr.; Edward Leo Kay, and Walter Richard Hausch, all of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 16, 1973, Ser. No. 351,692
Int. Cl. C08d *7/10*
U.S. Cl. 260—23.7 M **2 Claims**

1. A composition curable to a hard resin having enhanced resistance to thermo-oxidative deterioration of its mechanical properties due to the presence of p,p′-dibenzoylquinonedioxime, said composition comprising

	Parts by Weight
A butadiene polymer or copolymer	100
Vinyltriacetoxysilane	0.05–5.0
Silica	100–500
[An aromatic nitroso or a p-quinonedioxime compound of the class consisting of: N(2-methyl-2-nitropropyl)-4-nitrosoaniline, poly-p-dinitrosobenzene, and]	
p,p′-Dibenzoyl-quinonedioxime	0.5–5.0
Calcium stearate	0.5–5.0
Dicumyl peroxide	0.5–6.0.

3,886,107
LOW SHRINK WATER EXTENDED VINYL ESTER RESIN EMULSION

Daniel J. Najvar, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1973, Ser. No. 343,715
Int. Cl. C08f *33/02, 45/24*
U.S. Cl. 260—29.6 WQ **7 Claims**

1. A water-in-resin emulsion comprising about 20 to 80 percent of a dispersed aqueous phase, about 80 to 20 weight percent of a continuous resin phase wherein the continuous resin phase is a mixture of a terminally unsaturated vinyl ester resin and a copolymerizable alkenyl aromatic monomer in the respective weight proportions of about 80:20 to 30:70 and about 0.5 to 20 weight percent of a dimensional control agent which is soluble in the resin phase and consists of an interpolymer of a) 1 to 70 weight percent of a monoalkenyl aromatic monomer, b) 1 to 60 percent of an alkyl acrylate or methacrylate, and c) up to 50 percent of a hydroxyalkyl acrylate or methacrylate provided the combined weight of monomers a) and b) is at least 50 percent; and wherein said vinyl ester resin is a reaction product of about equivalent amounts of an unsaturated monocarboxylic acid and a polyepoxide.

3,886,108
PREPARATION OF FLUOROELASTOMER LATEX WITH MIXTURE OF MONO- AND DI-ESTERS OF PHOSPHORIC ACID

Austin Matthew Snow, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1973, Ser. No. 415,666
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 F **5 Claims**

1. A process for preparing a fluoroelastomer latex which comprises:

A. providing a solution in a volatile water-immiscible inert organic solvent of an elastomeric copolymer of vinylidene fluoride and at least one other ethylenically unsaturated fluorine-containing monomer,

B. forming an aqueous dispersion of said copolymer by mixing under vigorous agitation the solution of step A with an aqueous solution of an anionic surfactant which is a mixture of mono and di esters of phosphoric acid with nonylphenoxypolyethyleneoxyglycol, the weight ratio of monoester to diester in said mixture being about 40:60 to 60:40 and said mixture having an average molecular weight of about 4,000–6,000,

C. removing the organic solvent from the resulting aqueous dispersion by distillation,

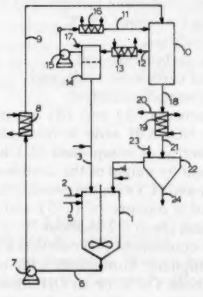
D. creaming the resulting solvent-free latex to form a creamed latex, and

E. separating the creamed latex obtained in step D.

3,886,109
PROCESS FOR PREPARING A LATEX OF A RUBBERY POLYMER FROM A SOLUTION OF THIS POLYMER IN AN ORGANIC SOLVENT

Rudolf van Hardeveld, Geleen, and Jozef L. M. van der Loos, Sittard, both of Netherlands, assignors to Stamicarbon, B. V., Geleen, Netherlands

Filed May 18, 1973, Ser. No. 361,619
Claims priority, application Netherlands, May 18, 1972, 7206711
Int. Cl. C08d *5/00;* **B01d** *12/00, 17/04*
U.S. Cl. 260—29.7 EM **15 Claims**



1. A process for preparing a latex of a rubbery polymer from a solution of said polymer in an organic solvent therefor comprising:

a. mixing said rubbery polymer solution with water and at least one emulsifier therefor,
b. evaporating said organic solvent such that a foamy product is formed from substantially the total amount of emulsion components,
c. separating said organic solvent in the gaseous state from said foamy product by passing said foamy product into a radially symmetrical space while concurrently flowing tangentially against said foamy emulsion a gas, vapor or gas-vapor mixture fluid flow, thereby producing a rotary flow in said space and subjecting said foamy emulsion to sufficient shearing forces caused by said flow such that said foamy emulsion is broken and said organic solvent is released in a gaseous state;
d. removing the gaseous organic solvent from said radially symmetrical space; and
e. recovering a concentrated aqueous latex solution of said rubbery polymer.

3,886,110
AQUEOUS COATING COMPOSITION
Tadahiro Go, and Takashi Suzuki, both of Kawasaki, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan
Filed Feb. 11, 1974, Ser. No. 441,460
Claims priority, application Japan, Feb. 17, 1973, 48-19443
Int. Cl. C08d *5/02;* **C08f** *27/04, 27/08*
U.S. Cl. 260—29.7 H **13 Claims**

1. An aqueous coating composition comprising a water-soluble or water-dispersible copolymer prepared by addition reacting with at least one α,β-unsaturated dicarboxylic compound a liquid copolymer comprising 90–50% by weight of 1,3-pentadiene units and 10–50% by weight of 1,3-butadiene units and having an average molecular weight of 500–5,000, the liquid copolymer having been prepared by the copolymerization of 1,3-pentadiene and 1,3-butadiene in the presence of a Friedel-Crafts type catalyst, and neutralization of the thus-obtained modified copolymer to make it soluble or dispersible in water.

3,886,111
HARDENABLE COMPOSITIONS
Hikoji Yoshimura, Fujisawa; Yuji Nakagawa; Hiroshi Yaginuma, both of Yokohama, and Atsutane Kimi, Kamakura, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan
Filed Dec. 21, 1973, Ser. No. 427,345
Claims priority, application Japan, Dec. 28, 1972, 48-1044
Int. Cl. C08f *45/36;* **C08g** *51/36*
U.S. Cl. 260—31.2 N **9 Claims**

1. A hardenable composition comprising (A) a modified polypentadiene containing at least two hydroxyl groups in its molecular structure and of a hydroxyl value of 70 – 250, said modified polypentadiene being obtained by introducing the hydroxyl and acyloxy groups to the unsaturated double bonds of a liquid polypentadiene of a number average molecular weight of 300 – 5,000, said modified polypentadiene containing 0.3 – 1 acyloxy group per hydroxyl group, (b) an organic diisocyanate compound selected from the group consisting of the aliphatic diisocyanate, alicyclic diisocyanate, aromatic diisocyanate and the mixtures of at least two of these compounds, said organic diisocyanate compound is present in an amount such that 0.3 – 4.0 equivalents of the isocyanate groups are present per equivalent of the hydroxyl groups contained in said modified polypentadiene and (c) a solvent which dissolves the modified polypentadiene and, in addition, is inert to the isocyanate group.

3,886,112
POLYVINYL ALCOHOL BASED COMPOSITION AND ARTICLES MADE THEREFROM
John J. Watson, Woodside, and Alice W. Pucknat, New York, both of N.Y., assignors to Polymer Films Inc., Woodside, N.Y.
Filed Dec. 17, 1973, Ser. No. 424,945
Int. Cl. C08f *45/34*
U.S. Cl. 260—33.4 R **6 Claims**

1. A composition of matter characterized by insolubility in small volumes of water and solubility in larger volumes of same, (comprising) consisting essentially of from 65 to 98 weight % of hot and cold water soluble, partially hydrolized polyvinyl alcohol: the degree of hydrolysis of said alcohol being such as to impart said insolubility and solubility to said composition and being at least 86%; from 0.1 to 35 weight % of at least one plasticizer; and from 0.1% to 5% of a (metal) borate salt (.) of sodium or potassium.

3,886,113
METAL-AMINE COMPLEX ACCELERATOR FOR POLYESTER RESIN CURING
Melville W. Uffner, Glen Mills, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Continuation-in-part of Ser. No. 285,907, Sept. 1, 1972, Pat. No. 3,804,799. This application Feb. 25, 1974, Ser. No. 445,710The portion of the term of this patent subsequent to Apr. 16, 1991, has been disclaimed.
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R **15 Claims**

1. A curable polyester mixture comprising:
a. an unsaturated polyester of a dihydric alcohol and an alpha-beta ethylenically unsaturated dicarboxylic acid,
b. ethylenically unsaturated reactive monomer,
c. free radical initiating organic peroxide, and
d. a promoter comprising a triethylene diamine compound at least in part present as a metal coordinated complex with cobalt and manganese salts.

3,886,114
SYNERGISTIC ANTIOXIDANT COMBINATION
Howard C. Beadle, Norwalk, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.
Filed Aug. 24, 1973, Ser. No. 391,235
Int. Cl. C08d *7/10*
U.S. Cl. 260—45.7 P **19 Claims**

1. A synergistic mixture for protecting natural rubber against heat and oxidation degradation which consists essentially of about 0.50 to 1.75 parts of a phosphite selected from the group consisting of decakis (nonylphenyl)heptakis (dipropylene glycol)octaphosphite, tetrakis(nonylphenyl)polypropylene glycol 425 diphosphite, polyphenyl dipropylene glycol phosphite and mixtures thereof, and about 1.50 to 0.25 parts of a phenol selected from the group consisting of mixed polybutylated bisphenol A, 2,6-di-t-butyl-4-methylphenol, styrenated phenol, 2,2′-methylenebis(4-methyl-6-t-butylphenol), 4,4′-dihydroxydiphenol, 4,4′-thiobis(6-t-butyl-o-cresol), p-t-butylphenol, p-isopropylphenol, p-(1,1,3,3-tetramethylbutyl)phenol, thymol, mixed m- and p-cresol, p-nonylphenol, and mixtures thereof.

3,886,115
STABILIZATION OF SYNTHETIC POLYMERS

Keisuke Murayama; Syoji Morimura; Takao Yoshioka; Hideo Horiuchi; Katsuaki Matsui; Tomoyuki Kurumada; Noriyuki Ohta, and Hisayou Ohsawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Japan

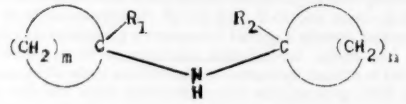
Continuation-in-part of Ser. No. 308,122, Nov. 20, 1972, abandoned. This application May 29, 1974, Ser. No. 474,189

Claims priority, application Japan, Nov. 24, 1971, 46-94278

Int. Cl. C08f *45/60;* **C08g** *51/60*

U.S. Cl. 260—45.9 R **5 Claims**

1. A synthetic polymer composition of a polymer selected from the group consisting of polyethylene, polypropylene, polyamide, polyurethane and polyvinyl chloride stabilized against photo- and thermal deterioration, wherein there is incorporated, in an amount sufficient to prevent said deterioration, at least one secondary amine having the formula



wherein

R_1 and R_2 may be the same or are different and represent —CN, —COOH, —COOM with M being a metal having from 1 to 4 valences, carbamoyl, N-alkyl-substituted carbamoyl where the alkyl substituents have up to 6 carbon atoms, alkoxycarbonyl having from 1 to 8 carbon atoms in the alkoxy moiety, or aryloxycarbonyl having from 6 to 10 carbon atoms in the aryloxy moiety, and

m and *n* individually are an integer of 4 to 5.

3,886,116
OXIDATION RESISTANT POLYMERIC COMPOSITIONS

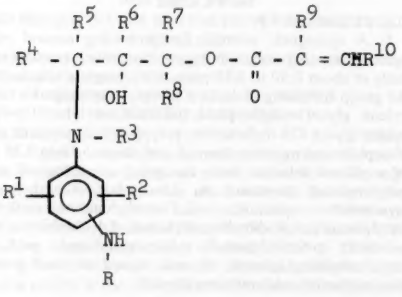
Carl R. Parks, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 153,446, June 15, 1971, Pat. No. 3,817,916. This application Mar. 13, 1974, Ser. No. 450,915

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.85 E **8 Claims**

1. An age resistant polymeric composition comprising a diene polymer susceptible to oxidative degradation, said diene polymer being natural rubber or a synthetic rubber selected from the group consisting of diene homopolymers, copolymers of diene monomers and copolymers of diene monomer and monoolefinic monomer, said diene polymer having incorporated therein a stabilizing amount of at least one compound having the following structural formula



wherein R is selected from the group consisting of alkyl radicals having one to 12 carbon atoms, cycloalkyl radicals having five to 12 carbon atoms, aralkyl radicals having seven to 24 carbon atoms and aryl radicals having six to 24 carbon atoms wherein R^1 and R^2 are selected from the group consisting of hydrogen and alkyl groups having one to four carbon atoms and wherein R^3 is selected from the group consisting of hydrogen, alkyl radicals having one to 12 carbon atoms, cycloalkyl radical having from five to 12 carbon atoms, and aralkyl radicals having seven to 24 carbon atoms, wherein R^4, R^5, R^6, R^7 and R^8 are selected from the group consisting of hydrogen and alkyl radicals having from one to four carbon atoms, wherein R^9 is selected from the group consisting of hydrogen; alkyl radicals having from one to four carbon atoms, carboxymethyl radical and carbalkoxymethyl radicals; and wherein R^{10} is selected from the group consisting of hydrogen; alkyl radicals having from one to four carbon atoms, phenyl and substituted phenyl radicals, alkyl radicals having one to four carbon atoms, alkoxy radicals having one or two carbon atoms, carboxyl radical and carbalkoxy radicals.

3,886,117
ULTRAVIOLET LIGHT STABILIZERS

Reginoldus Havinga, Schalkhaar, and Pieter Dirk Swaters, Lochem, both of Netherlands, assignors to Koninklijke Industrieele Maatschappij Noury and Van Der Lande N.V., Deventer, Netherlands

Division of Ser. No. 67,588, Aug. 27, 1970, Pat. No. 3,809,707. This application July 6, 1973, Ser. No. 377,113

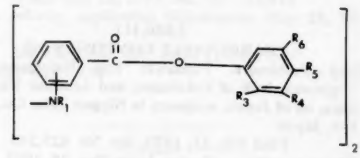
Claims priority, application Netherlands, Aug. 28, 1969, 6913138

Int. Cl. C08f *45/60;* **C08g** *51/60*

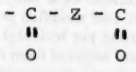
U.S. Cl. 260—45.85 N **11 Claims**

1. A process for preparing a stabilized polymer, consisting essentially of incorporating in the polymer

a compound having the general formula:



wherein R_1 represents a hydrogen atom, a lower alkyl group or an acetyl group; R_2 is a carbonyl or a group having the formula:



where Z represents a phenylene group or an alkylidene group having up to 12 carbon atoms; R_3, R_4, R_5 and R_6 are the same or different and each represents a hydrogen atom, a chlorine atom, a hydroxy group, an alkyl or alkoxy group having up to 12 carbon atoms or a phenyl group,

in amount sufficient to stabilize the polymer.

3,886,118

ROOM TEMPERATURE CURABLE COMPOSITIONS

Siegfried Nitzsche; Paul Hittmair; Wolfgang Hechtl; Eckhart Louis, and Ernst Wohlfarth, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Aug. 29, 1973, Ser. No. 392,704

Claims priority, application Germany, Aug. 29, 1972, 2242378

Int. Cl. C08f *11/04*

U.S. Cl. 260—46.5 G 5 Claims

1. A composition which is stable under anhydrous conditions and is curable at room temperature to an elastomeric solid when exposed to atmospheric moisture which comprises diorganopolysiloxanes having terminal groups which are condensable and a cross-linking agent which is obtained from the reaction of tert-butoxyacetoxysilanes with methyltriacetoxysilane in a weight ratio of 3:7 to 1:9 at a temperature of at least 120°C.

3,886,119

EPOXY END-CAPPED AROMATIC POLYIMIDES

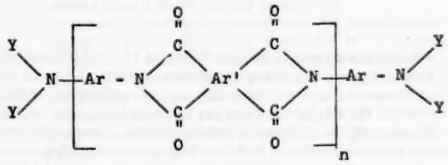
Gaetano F. D'Alelio, South Bend, Ind., assignor to University of Notre Dame du Lac, Notre Dame, Ind.

Filed Aug. 14, 1974, Ser. No. 497,491

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 CP 9 Claims

1. An epoxidized aromatic polyimide having the formula

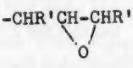


wherein

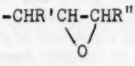
Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,

each Y is hydrogen or



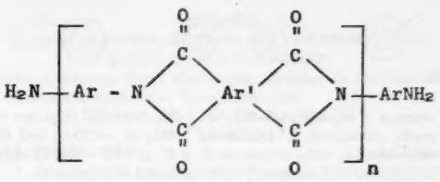
with the proviso that at least one Y is



and in which R′ is hydrogen or a hydrocarbon radical of 1 to 6 carbon atoms, and

n is a positive integer at at least 1.

4. A process for preparing an epoxidized aromatic polyimide comprising: reacting a diamine of the formula



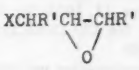
wherein

Ar is a divalent aromatic organic radical,

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical, and

n is a positive integer of at least 1,

with *n′* moles of an epoxy compound of the formula



wherein

X is halogen,

R′ is hydrogen or a hydrocarbon radical of 1 to 6 carbon atoms, and

n′ is a positive integer of 1 through 4 inclusive,

in the presence of a base at a temperature in the range of between ambient to about 100°C.

3,886,120

PROCESS FOR PREPARING AROMATIC POLYMER AND PRODUCT THEREOF

Norio Yagi; Hiroshi Okai; Makoto Fukuda, and Ikuji Kishi, all of Tokyo, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Japan

Filed July 9, 1974, Ser. No. 486,810

Claims priority, application Japan, July 11, 1973, 48-78142

Int. Cl. C08g *23/00*, *25/00*

U.S. Cl. 260—49 7 Claims

1. A process for preparing an aromatic polymer, which comprises bulk polymerizing a dialkali metal salt of a diphenol with a dihalogenobenzenoid compound containing an electron withdrawing group in at least one position ortho or para to the halogen atom at 200°–400°C in the absence of a solvent, wherein said dialkali metal salt of the diphenol and said dihalogenobenzenoid compound are polycondensed in the molar ratio range of 2/1 to 1/2.

7. An aromatic polymer is prepared by a process which comprises bulk polymerizing a dialkali metal salt of a diphenol with a dihalogenobenzenoid compound containing an electron withdrawing group in at least one position ortho or para to the halogen atom, at 200°–400°C in the absence of a solvent, wherein said dialkali metal salt of the diphenol and the dihalogenobenzenoid compound are polycondensed in the molar ratio of 2/1 to 1/2.

3,886,121

PROCESS FOR PREPARING AROMATIC POLYETHERS

Norio Yagi; Hiroshi Okai; Makoto Fukuda, and Ikuji Kishi, all of Tokyo, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Japan

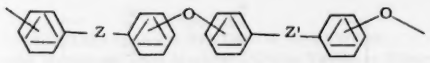
Filed July 30, 1974, Ser. No. 493,053

Claims priority, application Japan, July 30, 1973, 48-85617

Int. Cl. C08g *23/00*

U.S. Cl. 260—49 9 Claims

1. A process for preparing an aromatic polymer which comprises heating a condensed oligomer having an average of 1 – 10 units having the formula



wherein Z represents $-SO_2$ or —CO—, or the rings are directly connected; Z′ represents $-SO_2$ or —CO—; and the ether bond is ortho or para to Z or Z′; at 150° – 400°C under a nonreactive atmosphere in the absence of a solvent.

3,886,122

POLYURETHANE ADHESIVE COMPOSITION WITH MINIMAL MOISTURE SENSITIVITY

Hubert Jakob Fabris; David Ross Sponseller, both of Akron; Heinz Uelzmann, Tallmadge, and Arden Everett Schmucker, Alliance, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 11, 1974, Ser. No. 450,012

Int. Cl.[2] C08G *22/16*

U.S. Cl. 260—75 NP **6 Claims**

1. An adhesive composition prepared by intimately blending (A) a liquid isocyanate-terminated polyurethane prepolymer containing from about 5 to 30 weight percent free isocyanate groups and (B) a liquid cross-linking mixture comprising at least one organic polyhydroxy compound free of isocyanate groups and containing groups having active hydrogen atoms reactive with the isocyanate groups in the prepolymer (A) and a urethane catalyst, the ratio of the total isocyanate-reactive hydrogen atoms in (B) to isocyanate groups in (A) being from about 1.1:1 to 1.9:1, and the ratio of the calculated branching coefficient to the critical branching coefficient of the total system being at least 1.4, where the critical branching coefficient is the reciprocal of $f-1$ and where f is the average functionality of the reacting molecules in (A) and (B) having a functionality higher than 2.

3,886,123

POLYESTERAMIDES BASED ON BIS-AMINOALKYL HYDANTOINS OR DIHYDROURACILS

Jurgen Habermeier, Pfeffingen, and Walter Kunz, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

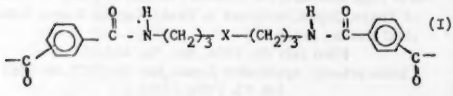
Filed Mar. 13, 1974, Ser. No. 450,932

Claims priority, application Switzerland, Mar. 27, 1973, 4400/73

Int. Cl. C08g *20/30*

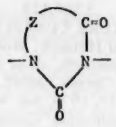
U.S. Cl. 260—75 N **6 Claims**

1. A linear, thermoplastic copolyester which contains amide groups and is based on terephthalic acid and/or isophthalic acid and alkanediols containing 2–10 carbon atoms, characterised in that it contains, as the co-component, 5–90 mol %, relative to the total molar quantity of dicarboxylic acid components, of a dicarboxylic acid diamide radical of the formula I



(I)

wherein the two carbonyl groups located on the aromatic ring are in the para- or meta-position to one another and X denotes an organic radical containing the grouping of the formula II



(II)

in which Z denotes an unsubstituted methylene or ethylene or a methylene or ethylene which is substituted by alkyl, cycloalkyl or phenyl.

3,886,124

CONDENSANT AND POLYESTERS AND POLYURETHANES PREPARED FROM HYDROXYMETHYL-PHENYLINDANS

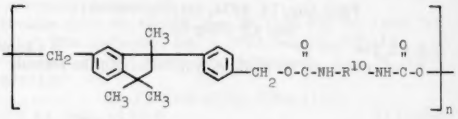
John Charles Wilson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 180,114, Sept. 13, 1971, abandoned. This application Apr. 3, 1973, Ser. No. 347,733

Int. Cl. C08g *22/08, 22/10;* **C03c** *1/78*

U.S. Cl. 260—77.5 AP **6 Claims**

1. A film forming polymer having repeating units consisting essentially of:



wherein n is a positive integer of at least 15 and R^{10} is selected from the group consisting of alkylene radicals of 2 to 10 carbon atoms, arylene radicals, arylenebisalkylene radicals wherein the alkylene portion has 1 to 6 carbon atoms, cycloalkylene radicals, alkylenebisarylene radicals wherein the alkylene radical contains 1 to 12 carbon atoms, alkylidenebisarylene radicals wherein the alkylidene portion contains 1 to 12 carbon atoms, aralkylene radicals wherein the alkylene portion has 1 to 12 carbon atoms.

3,886,125

POLYMER COMPLEXES

Richard C. Chromecek, Cannan, Conn., assignor to Airwick Industries, Inc., Carlstadt, N.J.

Filed May 12, 1972, Ser. No. 252,823

Int. Cl. C08f *27/04*

U.S. Cl. 260—78.3 UA **8 Claims**

1. A polymer complex particularly suitable as a carrier for active agent consisting essentially of (1) a polymer which is a homopolymer or copolymer comprising a monomer having a hydrophilic functional group and (2) from 0.1 to 90 mol percent, based on the hydrophilic functional groups present in said homopolymer or copolymer, of aluminum, zinc, or zirconium metal bound in complex form, said monomer being selected from the group consisting of hydroxyalkyl esters of α, β-unsaturated carboxylic acids and ethylenically unsaturated monomers containing an amino group, said copolymers further comprising from 0.5 to 60 mol percent of ethylenically unsaturated monomer free of said hydrophilic functional groups.

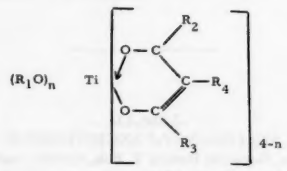
3,886,126
SOLUTIONS OF PRESSURE-SENSITIVE RESIN SOLUTIONS WITH IMPROVED VISCOSITY AND FLOW

Lawrence W. McKenna, Jr., Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 9, 1973, Ser. No. 349,512
Int. Cl. C08f 15/40
U.S. Cl. 260—80.73 4 Claims

1. An organic solvent solution comprising:

A. a chelate ester of orthotitanic ester having the formula:



wherein *n* is an integer of 2 or 3, R_1 is a C_2 to C_{10} alkyl, alkenyl, substituted alkyl or substituted alkenyl group, R_2 is a C_1 to C_6 alkyl, alkoxy, alkenyl or alkenoxy group, R_3 is a C_1 to C_6 alkyl or alkenyl group or a C_6 to C_{10} aryl group and R_4 is hydrogen or a C_1 to C_6 alkyl or alkenyl group, and R_2 and R_3 may be combined as an ethylene or a trimethylene group; and

B. an interpolymer comprising:

1. between 0.5 and 20 weight per cent of at least one monomer selected from the group consisting of N,N-diacetonylacrylamide and N,N-diacetonylmethacrylamide,
2. at least one monomer selected from the group consisting of esters of acrylic acid and methacrylic acid containing from 6 to 20 carbon atoms, and
3. optionally a monomer selected from the group consisting of α-olefins containing from two to 10 carbon atoms, vinyl esters of alkanoic acids containing from three to 10 carbon atoms, ethyl and methyl esters of acrylic and methacrylic acids, acrylonitrile, methacrylonitrile, styrene, and vinyl chloride,

wherein the interpolymer has a weight average molecular weight in the range of 10,000 to 500,000 and a glass transition temperature in the range of −15° to −75°C.;

wherein there are between 0.01 and 4 parts by weight of the chelate ester per 100 parts of interpolymer and wherein the stringiness index of the solution is less than 0.3 inches.

3,886,127
ALKALI METALATED ACETYLENE-CONJUGATED DIENE RANDOM COPOLYMER

Junji Furukawa, Kyoto; Eiichi Kobayashi, and Takahiro Kawagoe, both of Uji, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sept. 9, 1974, Ser. No. 504,036
Claims priority, application Japan, Sept. 12, 1973, 48-102231
Int. Cl. C08d 3/04, 3/06, 3/10
U.S. Cl. 260—82.1 10 Claims

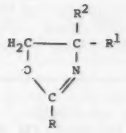
1. An alkali metalated acetylene-conjugated diene random copolymer obtained by reacting an acetylene-conjugated diene random copolymer having an acetylene unit content of 5–60 mol% and a block character *P* of 0.8–1.2 with an alkali metal or an alkali metal hydrocarbon compound in a solvent at a temperature of −100 ~ +100°C under an inert gas atmosphere.

3,886,128
OXAZOLINE EMULSIFIER IN POLYMERIZATION OF STYRENE AND BUTADIENE

John A. Frump, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Oct. 15, 1973, Ser. No. 406,755
Int. Cl. C08f 1/13
U.S. Cl. 260—84.7 6 Claims

1. In a process for the production of a styrenebutadiene copolymer by reacting styrene and butadiene in an emulsion system in the presence of a primary emulsifier and a secondary emulsifier at a temperature of 0° to about 20°C, and coagulating said copolymer by acidifying said emulsion to a pH of about 5, the improvement comprising the step of using as said secondary emulsifier an oxazoline in an amount of about 0.01 to about 0.50% based on the weight of said styrene-butadiene, said oxazoline corresponding to the formula



wherein R is an alkyl group of from three to about 17 carbon atoms and R^1 and R^2 are methyl, ethyl, or hydroxymethyl and can be the same or different.

3,886,129
COPOLYMERS OF VINYL CHLORIDE AND 2-HYDROXYPROPYL ACRYLATE

Dieter Kurz, and Herbert Kandler, both of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Feb. 8, 1974, Ser. No. 440,653
Claims priority, application Germany, Feb. 12, 1973, 2306808
Int. Cl. C08f 15/26
U.S. Cl. 260—86.3 3 Claims

1. Copolymers of vinyl chloride and 2-hydroxypropyl acrylate consisting of a copolymer with from 60 to 95% by weight of vinyl chloride monomer units and from 5 to 40% by weight of 2-hydroxypropyl acrylate monomer units, having a K-value of from 20 to 60 measured in cyclohexanone produced by the process comprising the steps of preparing an aqueous phase containing at least one water-soluble free radical polymerization catalyst and at least one oil-in-water emulsifier, continuously adding thereto a mixture of vinyl chloride and 2-hydroxypropyl acrylate in amounts sufficient to give a copolymerizate having from 60 to 95% by weight of vinyl chloride monomer units and from 5 to 40% by weight of 2-hydroxypropyl acrylate monomer units while stirring at a temperature of between 30°C and 80°C at a rate sufficient to maintain the autogeneous pressure of the vinyl chloride, and recovering said copolymer.

3,886,130

CATALYZED PRODUCTION OF HEAT STABLE FIBER-FORMING VINYL CHLORIDE

Drahoslav Lim; Miloslav Kolinsky, and Vaclava Jisova, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved No. 3 Narodni, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 108,567, Jan. 21, 1971, abandoned. This application June 29, 1972, Ser. No. 267,542

Claims priority, application Czechoslovakia, Jan. 21, 1970, 440-70

Int. Cl. C08f *1/42*

U.S. Cl. 260—92.8 R **11 Claims**

1. A method for preparing heat stable fiber forming vinyl chloride polymers comprising the steps of polymerizing monomeric vinyl chloride at a temperature in a range of from about −20°C to about +30°C in the presence of a lithium complex catalyst prepared by reacting an alkyl lithium compound, the alkyl group of which contains from 2 to 16 carbon atoms with at least one compound selected from the group consisting of organometal compounds of Group IV metals and alkoxide metal compounds of Group I through III metals of the Periodic Table of Elements which effects a decrease of basicity and metallation of said alkyl lithium compound.

3,886,131

NUCLEATION OF ISOTATIC POLYSTYRENE

Henry Nelson Beck, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 293,823, Oct. 2, 1972, Pat. No. 3,817,966. This application Mar. 21, 1974, Ser. No. 453,466

Int. Cl. C08f *7/04*

U.S. Cl. 260—93.5 A **1 Claim**

1. An isotactic polystyrene composition, the composition comprising in intimate admixture from about 99.995 to about 95 parts by weight of isotactic polystyrene and from about 0.005 to about 5 parts by weight of 2-hydroxybenzimidazole.

3,886,132

HUMAN PARATHYROID HORMONE

Hollis Bryan Brewer, Potomac, Md., and Claude D. Arnaud, Rochester, Minn., assignors to The Government of the United States Assistant Secretary, Department of Health, Education, and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 317,702, Dec. 21, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,303

Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*

U.S. Cl. 260—112.5 **1 Claim**

1. The peptide represented by the L-isomers of:

H_2N-Ser-Val-Ser-Glu-Ile-Gln-Leu-Met-His-Asn-Leu-Gly-Lys-His-Leu-Asn-Ser-Met-Glu-Arg-Val-Gln-Trp-Leu-Arg-Lys-Lys-Lys-Gln-Leu-Val-His-Asn-Phe-R, wherein R is a carboxyl group.

3,886,133

PROCESS FOR PREPARING 3-AMINOPROPYL ESTER OF BLEOMYCINIC ACID AND BLEOMYCINIC ACID INCLUDING AN ACID SALT AND A COPPER COMPLEX THEREOF

Hamao Umezawa, Tokyo; Tomohisa Takita, Asaka; Akio Fujii, Tokyo, and Takeyo Fukuoka, Omiya, all of Japan, assignors to Zaidon Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Filed Feb. 20, 1973, Ser. No. 333,629

Claims priority, application Japan, Feb. 17, 1972, 47-16020

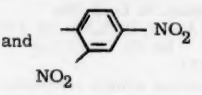
Int. Cl. C07c *103/52;* **A61k** *27/00;* **C08h** *1/00*

U.S. Cl. 260—112.5 **13 Claims**

1. A process for preparing a 3-aminopropyl ester of bleomycinic acid or an acid salt thereof which comprises reacting a 3-methyl-mercaptopropylaminobleomycin or an acid salt thereof at the mercapto sulfur atom with a halide compound having the formula:

$$R - X$$

wherein R represents $-CN$, $-CH_2COOH$, $-CH_2COOR_1$, $-CH_2CONH_2$

and  ;

R_1 represents a lower alkyl group; and X represents a halogen atom in an acidic aqueous medium.

3,886,134

ANALOGUES OF ANGIOTENSIN II

Frank Sipos, Norwich; Donald T. Pals, Oxford, and George S. Denning, Norwich, all of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Continuation-in-part of Ser. No. 17,920, March 9, 1970, abandoned. This application June 4, 1970, Ser. No. 43,595

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 **14 Claims**

1. A peptide of the formula:

R-L-arginyl-L-valyl-L-tyrosyl-L-valyl-L-histidyl-L-prolyl-R_1 wherein R is hydrogen, succinyl, L-aspartyl, sarcosyl, L-seryl, succinamyl, or D- or L-asparaginyl and R_1 is L-alanine, L- or D-leucine, glycine or L-isoleucine.

3,886,135

P-GLU-D-PHE-TRP-SER-TYR-D-PGL-LEU-ARG-PRO-GLY-H_2 AND INTERMEDIATES

Wayne A. McKinley, Wallingford, and Dimitrios Sarantakis, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 10, 1974, Ser. No. 459,513

Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*

U.S. Cl. 260—112.5 **5 Claims**

1. A compound selected from the class consisting of

L-p-Glu-D-Phe-L-Trp-L-Ser-L-Tyr-D-Pgl-L-Leu-L-Arg-L-Pro-Gly-NH_2, (I)

R^4-L-p-Glu-L-D-Phe-L-Trp-L-Ser(R^3)-L-Tyr(R^2)-D-Pgl-L-Leu-L-Arg(N^G-R^1)-L-Pro-Gly-X (II)

and non-toxic acid addition salts thereof; wherein

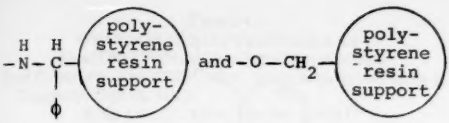
R^1 is a protecting group for the N , N and N nitrogen atoms of arginine selected from the group consisting of nitro, tosyl, benzyloxycarbonyl, adamantyloxycarbonyl and tert-butyloxycarbonyl or R^1 is hydrogen;

R^2 is a protecting group for the phenolic hydroxyl group of tyrosine selected from the group consisting of tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, p-bromobenzyloxycarbonyl and benzyloxycarbonyl or R^2 is hydrogen;

R^3 is a protecting group for the alcoholic hydroxyl group of serine and is selected from the group consisting of acetyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,6-dichlorobenzyl and benzyl or R^3 is hydrogen;

R^4 is selected from the group consisting of hydrogen or an α-amino protecting group;

X is selected from the group consisting of NH_2, OH, O-(lower)alkyl, O-benzyl and an anchoring bond linked to a solid polystyrene resin represented by one of the formula



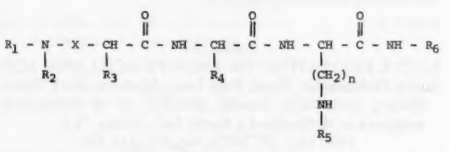
wherein said polystyrene resin is cross linked through the phenyl group on each second carbon atom of the alkyl chain of said polystyrene; with the proviso that at least one of R^1, R^2 and R^3 is other than hydrogen and wherein Pgl means C phenylglycyl.

3,886,136
NEW SUBSTRATES FOR DIAGNOSTIC USE, WITH HIGH SUSCEPTIBILITY TO TRYPSIN AND OTHER PROTEOLYTIC ENZYMES OF THE TYPE PEPTIDE PEPTIDOHYDROLASES

Karl Goran Claeson; Birgitta Gunilla Karlsson, both of Goteborg, and Lars-Gundro Svendsen, Molndal, all of Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Apr. 24, 1973, Ser. No. 354,038
Claims priority, application Sweden, May 2, 1972, 5758/72
Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*
U.S. Cl. 260—112.5 **19 Claims**

1. Substrate with a high susceptibility to peptide peptidohydrolases which is represented by the formula:



or acid addition salts thereof, where R_1 is selected from the group consisting of hydrogen, an acyl alkyl-carbonyl having 1–12 carbon atoms, a ω-aminoalkyl-carbonyl having 1–12 carbon atoms in a straight chain, cyclohexyl-carbonyl, a ω-cyclohexylalkyl-carbonyl having 1–6 carbon atoms in a straight chain, 4-aminomethyl-cyclohexylcarbonyl, benzoyl, a ω-phenylalkyl-carbonyl having 1–6 carbon atoms in a straight chain, benzenesulphonyl and 4-toluene-sulphonyl; R_2 is selected from the group consisting of hydrogen, phenyl, cyclohexyl and an alkyl having 1–6 carbon atoms; X is selected from the group consisting of methylene and a single bond; R_3 is selected from the group consisting of straight, branched and cyclic alkyl groups having 3–8 carbon atoms; R_4 is selected from the group consisting of straight, branched and cyclic alkyl groups having 3–8 carbon atoms, phenyl and benzyl; *n* is 3 or 4; R_5 is selected from the group consisting of hydrogen and guanyl; and R_6 is selected from the group consisting of phenyl, nitrophenyl, methylnitrophenyl, naphthyl, nitronaphthyl, quinolyl, and nitroquinolyl.

3,886,137
P-GLU-D-PHE-TRP-SER-TYR-D-LEU-LEU-ARG-PRO-GLY-NH_2 AND INTERMEDIATES

John P. Yardley, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 21, 1973, Ser. No. 417,983
Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*
U.S. Cl. 260—112.5 **8 Claims**

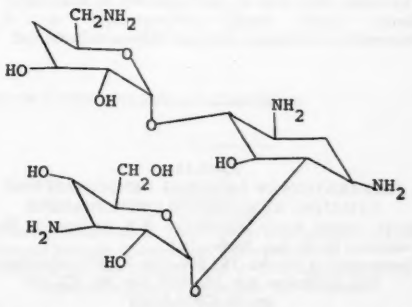
1. A compound selected from the group consisting of
L-p-Glu-D-Phe-L-Trp-L-Ser-L-Tyr-D-Leu-L-Leu-L-Arg-L-Pro-Gly-NH_2
and
R^4-L-P-Glu-D-Phe-L-Trp-L-Ser(R^3)-L-Tyr-(R^2)-D-Leu-L-Leu-L-Arg-(N^G-R^1)-L-Pro-Gly-R
and its non-toxic salts; wherein
R is selected from the class consisting of NH_2, OH, O-(lower)-alkyl and O-benzyl; R^1 is a protecting group for the N^{δ}, N^{ω} and $N^{\omega'}$ nitrogen atoms of arginine selected from the class consisting of nitro, tosyl, benzyloxycarbonyl, and adamantyloxycarbonyl; or R^1 is hydrogen;
R^2 is a protecting group for the phenolic hydroxyl group of tyrosine selected from the class consisting of acetyl, tosyl, benzoyl, tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,4 dichlorobenzyl and benzyloxycarbonyl or R^2 is hydrogen;
R^3 is a protecting group for the alcoholic hydroxyl group of serine and is selected from the class consisting of acetyl, tosyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,4 dichlorobenzyl, benzyl and benzyloxycarbonyl; or R^3 is hydrogen;
R^4 is selected from the class consisting of hydrogen or an α-amino protection group, with the proviso that at least one of R^1, R^2 and R^3 is a protecting group.

3,886,138
4′-DEOXYKANAMYCIN A

Takayuki Naito; Susumu Nakagawa, and Yoshio Abe, all of Tokyo, Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 21, 1973, Ser. No. 427,199
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 K **2 Claims**

1. The compound having the formula



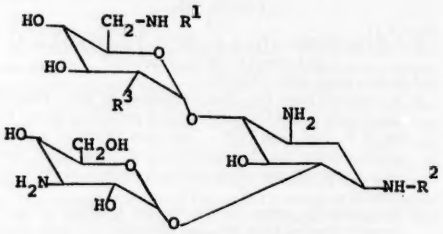
or a pharmaceutically acceptable nontoxic salt thereof.

3,886,139
DERIVATIVES OF KANAMYCIN

Takayuki Naito; Susumu Nakagawa, and Yoshio Abe, all of Tokyo, Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 23, 1973, Ser. No. 335,210
Int. Cl. C07c 47/18
U.S. Cl. 260—210 K **7 Claims**

1. A compound having the formula



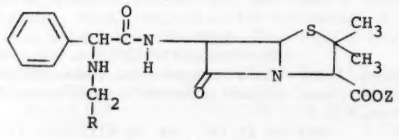
in which R^1 is H, R^2 is L-(−)-δ-amino-α-hydroxyvaleryl and R^3 is OH or NH_2; or a nontoxic pharmaceutically acceptable salt thereof.

3,886,140
PENICILLIN DERIVATIVES

Bong Kuk Lee, Old Bridge, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 30, 1972, Ser. No. 258,028
Int. Cl. C07d 99/16
U.S. Cl. 260—239.1 **3 Claims**

1. A compound of the formula



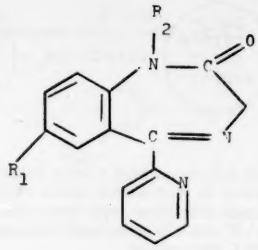
wherein R is alkyl of up to 7 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, phenyl, naphthyl, ortho-substituted phenyl, or ortho substituted naphthyl wherein said ortho substituent is halogen, hydroxy, carboxyl, amido, or methoxy; and Z is hydrogen, alkyl of up to 7 carbon atoms, an alkali metal, an alkaline earth metal, dibenzylamine or N,N-dibenzylethylenediamine; and acid addition salts thereof.

3,886,141
PREPARATION OF 5-PYRIDYL BENZODIAZEPINE UTILIZING HEXAMETHYLENETETRAMINE

George Oswald Chase, Hawthorne, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

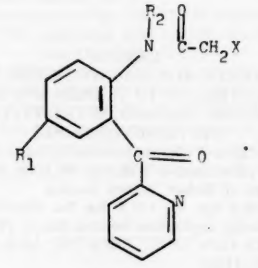
Continuation of Ser. No. 187,500, Oct. 7, 1971, abandoned. This application July 17, 1972, Ser. No. 272,255
Int. Cl. C07d 53/06
U.S. Cl. 260—239.3 D **6 Claims**

1. A process for preparing a compound of the formula:



I

wherein R_1 is selected from the group consisting of hydrogen and halogen and R_2 is selected from the group consisting of hydrogen
which comprises reacting a compound of the formula:



II

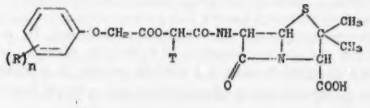
wherein X is selected from the group consisting of chlorine, bromine and iodine and R_1 and R_2 are as above
with hexamethylenetetramine.

3,886,142
6-ACYL DERIVATIVES OF AMINOPENICILLANIC ACID

Andre Furlenmeier, Basel; Paul Lanz, Muttenz; Karl Vogler, Riehen, and Guido Zanetti, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 27, 1972, Ser. No. 318,736
Claims priority, application Switzerland, Jan. 12, 1972, 434/72
Int. Cl. C07d 99/16
U.S. Cl. 260—239.1 **12 Claims**

1. A compound represented by the formula



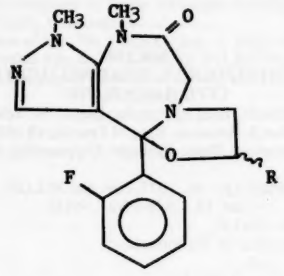
wherein R is halogen, lower alkyl, lower alkoxy, nitro, lower alkoxy-lower alkyl, di-lower alkyl amino, lower alkylsulfonyl amido, bis-lower alkylsulfonylamido or lower alkanoyl-amido, *n* is an integer of 0–2 and T is a C_2–C_5 alkyl group,
pharmaceutically acceptable salts and hydrated forms thereof.

3,886,143
OXAZOLO [3,2-D]PYRAZOLO[4,3-F] [1,4]DIAZEPIN-6(7H)-ONE COMPOUNDS

Ivan C. Nordin, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Jan. 21, 1974, Ser. No. 434,817
Int. Cl. C07d *99/02*
U.S. Cl. 260—239.3 T 4 Claims

1. A compound of the formula



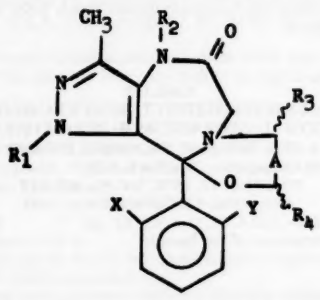
wherein R is hydrogen, methyl or phenyl.

3,886,144
OXAZOLO(AND OXAZINO)(3,2-D)PYRAZOLO-(3,4-F)(1,4)DIAZEPIN-5(6H)-ONE COMPOUNDS

Ivan C. Nordin, and Horace A. Dewald, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Jan. 21, 1974, Ser. No. 434,762
Int. Cl. C07d *99/02*
U.S. Cl. 260—239.3 T 6 Claims

1. A compound of the formula



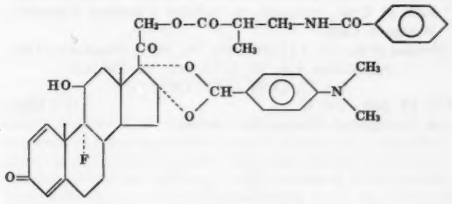
wherein R_1 is a branched or straight chain hydrocarbon group of from one to four carbon atoms; R_2 and R_3 are selected from the group consisting of hydrogen and methyl; R_4 is selected from the group consisting of hydrogen, methyl, ethyl and phenyl; X and Y are selected from the group consisting of hydrogen and fluorine and A is selected from the group consisting of a single bond and a methylene radical; with the provisio that at least one of R_3 and R_4 is hydrogen; and when A is methylene both R_3 and R_4 are hydrogen.

3,886,145
NEW DERIVATIVE OF TRIAMCINOLONE

Enrico Diamanti, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche/Riunite S.p.A., Italy

Filed Apr. 23, 1973, Ser. No. 353,680
Claims priority, application Italy, Apr. 28, 1972, 49946/72
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 D 1 Claim

1. A new derivative of triamcinolone 21-(β-benzoylaminoisobutyryl)- 16α, 17α-(p-dimethylaminobenzyliden) triamcinolone having the following formula:

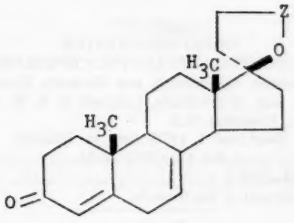


3,886,146
17-HYDROXY-3-OXO-17α-PREGNA-4,7-DIENE-21-CARBOXYLIC ACID-LACTONE, 4',5'-DIHYDROSPIRO[ANDROSTA-4,7-DIENE-17,2'(3'H)-FURAN]-3-ONE, AND INTERMEDIATES THERETO

Edward A. Brown, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 8, 1974, Ser. No. 449,276
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 R 7 Claims

1. A compound of the formula



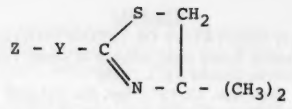
wherein Z represents carbonyl or methylene.

3,886,147
TRANQUILIZERS

Herbert L. Wehrmeister, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Division of Ser. No. 312,075, Dec. 4, 1972, abandoned. This application May 31, 1974, Ser. No. 475,064
Int. Cl. C07d *91/24*
U.S. Cl. 260—240 D 3 Claims

1. A thiazoline compound corresponding to the formula:



wherein Z is p-methoxyphenyl or p-acetamidophenyl and Y is —CH=CH—.

3,886,148

INSECTICIDAL ACTIVE GERANYL AND CITRONYL AMINE DERIVATIVES AND THEIR EPOXIDES

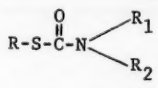
Ferenc M. Pallos, Walnut Creek, and Julius J. Menn, Saratoga, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 172,202, Aug. 16, 1971, abandoned. This application Apr. 30, 1973, Ser. No. 356,024

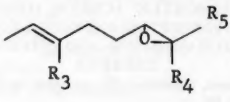
Int. Cl. C09b *23/00;* **C07d** *1/22*

U.S. Cl. 260—240 H **12 Claims**

1. A compound having the formula:



wherein R is selected from the group consisting of cyclohexyl, chlorobenzyl, phenyl and substituted phenyl, wherein said substituents are selected from halogen, alkyl having 1 –4 carbon atoms, methoxy and methylthio; R_1 is hydrogen; R_2 is



wherein R_3, R_4 and R_5 are methyl.

3,886,149

AMINO SUBSTITUTED DITHIOCARBONYLTHIOACETYL CEPHALOSPORINS

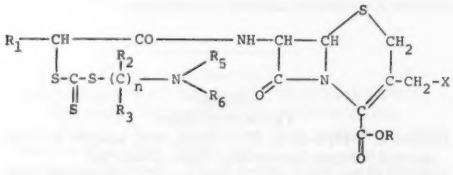
Uwe D. Treuner, Regensburg, and Hermann Breuer, Burgweinting, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 1, 1972, Ser. No. 258,686

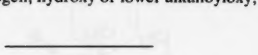
Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **9 Claims**

1. A compound of the formula



wherein R is hydrogen, lower alkyl, alkali metal, trimethylsilyl or



R_1 is phenyl; R_2, R_3 and R_5 each is hydrogen or lower alkyl; R_4 is lower alkyl, phenyl or phenyl-lower alkyl; R_6 is lower alkyl or R_5 and R_6 together complete one of the unsubstituted heterocyclics piperidino, morpholino, thiamorpholino or piperazino; X is hydrogen, hydroxy or lower alkanoyloxy; and *n* is 1, 2, 3 or 4.

3,886,150

4-OXO-5-THIAZOLINYL(THIAZINYL)ACETAMIDO-CEPHALOSPORANIC

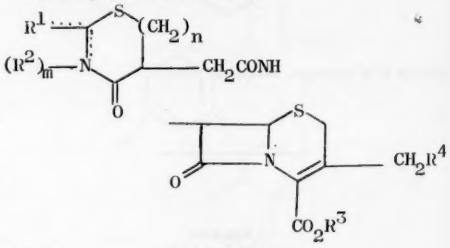
John H. Sellstedt, King of Prussia; Daniel M. Teller, Devon, and Charles J. Guinosso, King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 18, 1973, Ser. No. 352,158

Int. Cl. C07d *99/24, 99/16*

U.S. Cl. 260—243 C **20 Claims**

1. A compound of the formula:



wherein

R^1 is a member selected from the group consisting of oxo, (lower)alkylimino, benzylimino, (lower)alkylidenehydrazino, and di(lower)alkylamino radicals;

R^2 is a member selected from the group consisting of hydrogen, benzyl and (lower)alkyl radicals when *m* is 1;

R^3 is a member selected from the group consisting of hydrogen and (lower)alkyl radicals, and an alkali metal cation;

n is one of the integers 0 and 1;

m is one of the integers 0 and 1;

and the dotted lines represent valence bonds based upon the substituent R^1.

3,886,151

7-[2-(HETEROAZINYLTHIO)ACETAMIDO] CEPHALOSPORANIC ACID DERIVATIVES

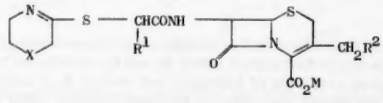
Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 452,012

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C **4 Claims**

1. A compound of the formula:



in which

R^1 is a member selected from the group consisting of —H, alkyl of 1 to 3 carbon atoms and phenyl;

R^2 is a member selected from the group consisting of —H and alkanoyloxy of 2 to 6 carbon atoms;
X is one of the groups —O—, —S— or —NH—;
M is a member selected from the group consisting of —H, an alkali metal cation and the ammonium ion; and the pharmaceutically acceptable acid addition salts thereof.

3,886,152
AMINODIARYL-INDOLYLMETHANE DYESTUFFS

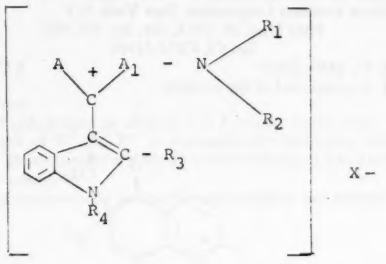
Hans Peter Kuhlthau, and Roderich Raue, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation of Ser. No. 788,633, Jan. 2, 1969, abandoned. This application Apr. 6, 1972, Ser. No. 241,855The portion of the term of this patent subsequent to Feb. 15, 1989, has been disclaimed.

Int. Cl. C07d *27/5*

U.S. Cl. 260—247.5 FP **15 Claims**

1. A dyestuff having the formula



in which
the radicals A and A_1 stand for members of the class phenyl and naphthyl, of which at least one represents naphthyl,
R_1 stands for hydrogen; lower alkyl, hydroxyethyl; chloroethyl; cyanoethyl; benzyl; phenyl; or ethoxyphenyl;
R_2 stands for hydrogen; lower alkyl; hydroxyethyl;
R_3 denotes hydrogen; methyl; phenyl; chlorophenyl;
R_4 stands for hydrogen; lower alkyl; cyanoethyl; benzyl; and the dyestuff may contain a further substituent in the phenyl radical of the indole ring selected from the group consisting of Cl, methyl and ethyl or a further substituent in A and A_1 of the groups Cl, Br, methyl and methoxy; and
X is a largely colorless anionic radical which does not impair the solubility of the dyestuff in an undesirable way.

3,886,153
PURIFICATION OF CYANURIC ACID

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, New York, N.Y.

Filed Jan. 9, 1974, Ser. No. 431,947

Int. Cl. C07d *55/36*

U.S. Cl. 260—248 A **7 Claims**

1. A process for recovering cyanuric acid as hydrated cyanuric acid which comprises:
digesting crude cyanuric acid in a digestion solution containing a mineral acid;
cooling the digestion solution to precipitate cyanuric acid crystals;
separating the cyanuric acid crystals from the digestion solution;
dispersing the cyanuric acid crystals in a sufficient amount of water at a temperature below about 57°C to remove all but residual traces of digestion solution from the crystals;
agitating the dispersed crystals for about 0.25 to about 5 hours to hydrate the cyanuric acid crystals; and
recovering free-flowing, hydrated, crystalline cyanuric acid free of any hard cement-like masses.

3,886,154
METHOD FOR THE PREPARATION OF PHTHALAZINO (2,3-B) PHTHALAZINE-5(14H), 12(7H)-DIONE

Anacleto Gianantonio, and Antonia Coco, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

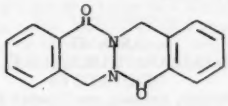
Filed Apr. 18, 1974, Ser. No. 461,837

Claims priority, application United Kingdom, Apr. 27, 1973, 20200/73

Int. Cl. C07d *51/06*

U.S. Cl. 260—250 P **7 Claims**

1. A process for preparing phthalazino[2,3-b]-phthalazine-5(14H), 12(7H)-dione of the formula



which comprises the step of reducing with hydrogen in the presence of a hydrogenation catalyst at up to 60 atmospheres pressure or in nacscent form and concomitantly cyclizing a compound selected from the group consisting of phthalaldehydic acid azine, a water-soluble salt or a lower alkyl ester of the said azine, 2-phthalidyl-1(2H)-phthalazinone or 2-(3-phthalimidinyl)-1(2H)-phthalazinone.

3,886,155
3-PHENYL-4;5-DICHLORO PYRIDAZINYL ALKANOATES

Alfred Diskus, Linz/Danube; Rupert Schonbeck, Leonding near Linz/Danube; Engelbert Kloimstein, Eferding, and Hubert Mayr, Leonding near Linz/Danube, all of Austria, assignors to Osterreichische Stickstoffwerke, Linz/Danube, Austria

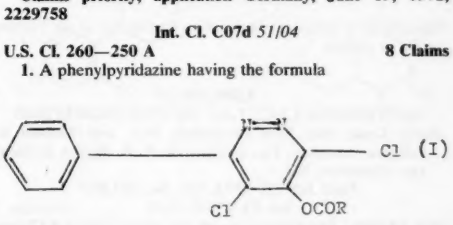
Filed June 1, 1973, Ser. No. 366,017

Claims priority, application Germany, June 19, 1972, 2229758

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A **8 Claims**

1. A phenylpyridazine having the formula



in which R is selected from the group consisting of alkyl having 1 to 20 carbon atoms, β-chloroethyl and phenyl.

3,886,156
0-(4-METHYL-5-METHYLMERCAPTOPYRIMIDIN-6-YL)(THIONO)-PHOSPHORIC(PHOSPHONIC) ACID ESTERS OR ESTER AMIDES

Wolfgang Hofer, Wuppertal-Elberfeld; Ingeborg Hammann, Cologne; Bernhard Homeyer, Opladen, and Wilhelm Stendel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

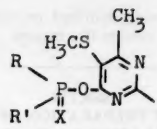
Filed Aug. 28, 1972, Ser. No. 284,379

Claims priority, application Germany, Sept. 4, 1971, 2144392

Int. Cl. C07d *51/40*

U.S. Cl. 260—251 P **7 Claims**

1. An 0-pyrimidyl(thiono)-phosphoric(phosphonic) acid ester or ester amide of the formula:



in which:

R is alkyl, alkoxy or alkylamino each with 1 to 6 carbon atoms,

R′ is alkoxy with 1 to 6 carbon atoms,

R″ is alkyl or alkylmercapto each with 1 to 3 carbon atoms, and

X is oxygen or sulfur.

3,886,157

5,6,8,8B,9-PENTAAZANAPHTH[3,2,1-D,E]ANTHRACENE DERIVATIVES

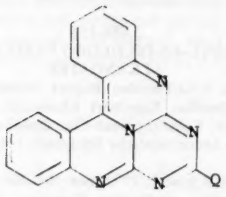
Roland A. E. Winter, Armonk, and Thomas J. Villani, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 129,127, March 29, 1971, abandoned. This application Feb. 28, 1973, Ser. No. 336,573

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 F **5 Claims**

1. A compound represented by the formula



wherein Q is di(lower)alkyl amino having up to six carbon atoms or phenyl.

3,886,158

6H-PYRIMIDO[1,2-C][1,3,5] BENZOXADIAZEPINES

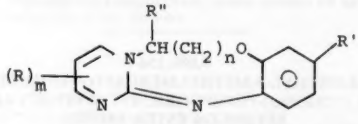
Harry Louis Yale, New Brunswick, N.J., and Ramesh B. Petigara, Lansdale, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 26, 1973, Ser. No. 382,803

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 F **4 Claims**

1. A compound of the formula



wherein

m is 1 or 2; when *m* is 1, R occupies either position -4 or -5 of the starting 2-aminopyrimidine, but when R is halogen it occupies only position -5; when *m* is 2, the two R's occupy the 4- and 5-positions of the starting 2-aminopyrimidine, but only one of the two R-substituents can be halogen and it must occupy the 5-position;

R is the same or different and is hydrogen, F, Cl, Br, alkyl of from 1 to 4 carbons, benzyl, phenyl, or mono-substituted phenyl wherein the substituent is F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkoxy of from 1 to 4 carbons, or trifluoromethyl with the proviso that R may not be adjacent tertiary alkyl;

R′ is hydrogen, F, Cl, Br, I, alkyl of from 1 to 4 carbons, alkylsulfonyl wherein the alkyl has from 1 to 4 carbons, dialkylamidosulfonyl wherein each alkyl has from 1 to 4 carbons, trifluoromethyl;

n is 0 or 1;

and R″ is hydrogen or alkyl of from 1 to 4 carbons; at least one of R, R′, and R″ being hydrogen;

and pharmaceutically acceptable acid-addition salts thereof.

3,886,159

ESTERS OF 6-(SUBSTITUTED)-5,6,7,8-TETRA-HYDRO-8-ETHYL-5-OXO-2-(METHYLTHIO)PYRIDO[2,3-D]PYRIMIDINE-6-CARBOXYLIC ACIDS

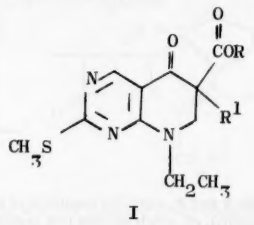
Arthur A. Santilli, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,403

Int. Cl. C07d *51/40*

U.S. Cl. 260—256.5 **6 Claims**

1. A compound of the formula:



I

wherein R is lower alkyl and R^1 is methyl or lower alkoxycarbonylmethyl.

3,886,160

2-(2-METHYL-5-NITRO-1-IMIDAZOLYL) ETHYL-2-THIOPSEUDOUREAS

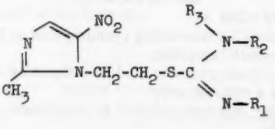
Robert C. Tweit, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 293,069, Sept. 28, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,604

Int. Cl.² C07D *49/36*, *51/40*

U.S. Cl. 260—256.5 R **18 Claims**

1. A compound of the formula



wherein R_3 is hydrogen or lower alkyl containing 1–7 carbon atoms and R_1 and R_2 are hydrogen, lower alkyl containing 1–7 carbon atoms, or R_1 and R_2 together are vinylene, nitrovinylene, or trimethylene or the pharmaceutically acceptable acid addition salts thereof.

3,886,161

2-PIPERAZINO-3-CYANO-5-PHENYL-PYRIDINES

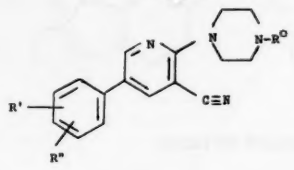
Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 98,124, Dec. 14, 1970, Pat. No. 3,717,645, which is a continuation of Ser. No. 42,540, June 1, 1970, Pat. No. 3,660,415. This application Oct. 18, 1972, Ser. No. 298,600

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 H 2 Claims

1. A compound of the formula:



wherein

R^o is hydrogen or alkyl of 1 to 4 carbon atoms, and

each of R' and R'' is independently hydrogen, halo of atomic weight of from 19 to 80 or alkoxy of 1 to 3 carbon atoms, or

a pharmaceutically acceptable acid addition salt thereof.

3,886,162

ACRIDONE CARBOXYLIC ACIDS AND DERIVATIVES

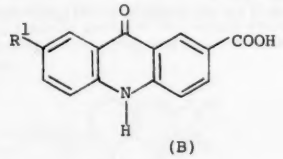
Jurg R. Pfister, Los Altos; Ian T. Harrison, Palo Alto, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 273,291, July 19, 1972, Pat. No. 3,835,139. This application Mar. 12, 1974, Ser. No. 450,352

Int. Cl. C07d *37/20*

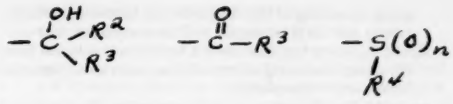
U.S. Cl. 260—279 R 6 Claims

1. A compound selected from those represented by the following formula:



(B)

and the pharmaceutically acceptable, non-toxic lower alkyl and glycerol esters, unsustituted, monoalkyl or dialkyl substituted amides and salts therreof; wherein R^1 is hydroxy and alkanoyloxy of thereof; 1 to 7 carbon atoms, trichloroacetoxy and 2-chloropropionyloxy esters thereof; mercapto; lower alkylthio of from 1 to 5 carbon atoms, trifluoromethyl; or a group selected from those of salts thereof; wherein the formulas:



in which R^2 is hydrogen, lower alkyl of from 1 to 5 carbon atoms, or cycloalkyl of from 3 to 6 carbon atoms; R^3 is hydrogen, lower alkyl of from 1 to 5 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, phenyl, substituted phenyl (in which the substituent is halo, lower alkyl of from 1 to 5 carbon atoms, lower alkoxy of from 1 to 5 carbon atoms, lower alkylthio of from 1 to 5 carbon atoms, trifluoromethyl or cyano); or a monocyclic aromatic heterocyclic group selected from furyl, pyrryl, thienyl, pyridyl, imidazolyl or oxazolyl; n is the integer 1 or 2; R^4 is lower alkyl of from one to five carbon atoms when n is 1 and R^4 is lower alkyl of from 1 to 5 carbon atoms, hydroxy, amino, monolower alkyl amino of from 1 to 5 carbon atoms, or dilower alkyl amino, wherein each of said lower arkyl groups is of one to five carbon atoms, when n is 2.

3,886,163

1,3(2H,4H)-DIOXOISOQUINOLINE-4-CARBOXAMIDES

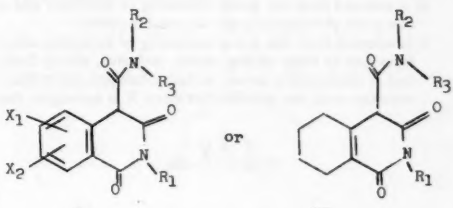
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 649,462, June 28, 1967, abandoned, and a continuation-in-part of Ser. No. 674,664, Oct. 11, 1967, abandoned. This application Feb. 5, 1971, Ser. No. 113,082

Int. Cl. C07d *35/38*, *35/08*, *35/14*

U.S. Cl. 260—281 8 Claims

1. A compound of the formula



I or II

wherein:

R_1 is selected from the group consisting of hydrogen; alkyl having from 1 to 6 carbon atoms; alkyl phenyl with up to one substituent selected from the group consisting of fluorine, chlorine, bromine, methoxy, ethoxy and alkyl having up to 3 carbon atoms; and benzyl with up to 1 nuclear substituent selected from the group consisting of fluorine, chlorine, bromine, methoxy, ethoxy and alkyl having up to 3 carbon atoms;

R_2 is selected from the group consisting of hydrogen; primary alkyl having from 1 to 6 carbon atoms;

R_3 is selected from the group consisting of hydrogen; alkyl having from 1 to 6 carbon atoms, allyl; cycloalkyl having from 3 to 6 carbon atoms; polyfluoroalkyl having up to 3 carbon atoms; phenyl having up to 2 substituents each identically selected from the group consisting of fluorine, chlorine, bromine, methoxy, ethoxy, and alkyl having up to 3 carbon atoms, acetyl, trifluoromethyl, or having up to 2 substituents each selected from the group chloro, methyl, methoxy and trifluoromethyl; naphthyl and phenylalkyl having up to 2 carbon atoms in the alkyl moiety with up to 1 nuclear substituent selected from the

group consisting of fluorine, chlorine, bromine, methoxy, ethoxy and alkyl having up to 3 carbon atoms; and

R_2 and R_3, taken together, form a heterocycle selected from the group consisting of pyrrolidine, piperidine, hexamethyleneimine, morpholine;

provided that R_2 always is hydrogen when R_3 is selected from the group consisting of tertiary alkyl, tertiary alkenyl, nitro-substituted phenyl and benzoyl; and

X_1 and X_2 are at the 6 and 7 positions respectively are each identically selected from the group consisting of hydrogen, fluorine, chlorine, bromine, methoxy, ethoxy and alkyl having up to 3 carbon atoms and trifluoromethyl or ether X_1 or X_2 is H and the other is as defined above.

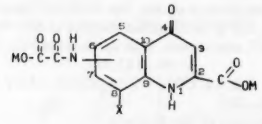
3,886,164

QUINOLYL OXAMIC ACIDS

John B. Wright, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 20, 1972, Ser. No. 316,977
Int. Cl. C07d *33/48*
U.S. Cl. 260—287 R **10 Claims**

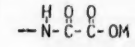
1. A compound of the formula



wherein

M is selected from the group consisting of hydrogen and a non-toxic pharmaceutically acceptable cation;

X is selected from the group consisting of hydrogen, alkyl from one to three carbon atoms, inclusive; alkoxy from one to three carbon atoms, inclusive halogen, and trifluoromethyl with the proviso that when X is hydrogen, the



grouping is limited to the 6 position.

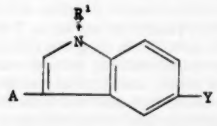
3,886,165

INDOLYLIMIDOYLHETEROCYCLICS

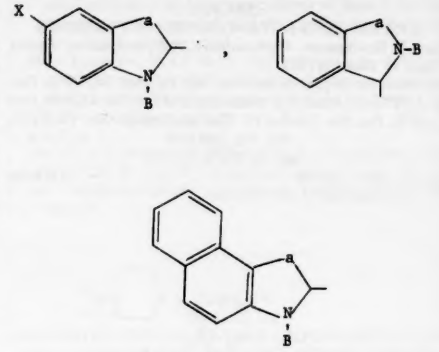
Yao Hua Wu, and Richard P. Ryan, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Nov. 13, 1972, Ser. No. 306,065
Int. Cl. C07d *33/50*
U.S. Cl. 260—288 R **23 Claims**

1. An indolyl compound selected from the group consisting of bases having the formula



wherein A is selected from the group consisting of



and B represents the radical

wherein

a is -CH=CH- or $-CH_2CH_2-$;

X is hydrogen or lower alkoxy of 1 to 4 carbon atoms inclusive;

Y is hydrogen or lower alkoxy of 1 to 4 carbon atoms inclusive;

R^1 is hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

R^2 is hydrogen;

R^3 is lower alkyl of 1 to 4 carbon atoms inclusive or cycloalkyl of 3 to 6 carbon atoms inclusive;

R^2 and R^3 are joined together to form a pyrrolinyl ring which may be substituted by up to two lower alkyl groups of 1 to 4 carbon atoms inclusive; and

pharmaceutically acceptable non-toxic acid addition salts thereof.

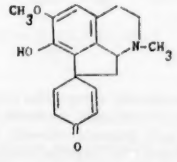
3,886,166

METHOD FOR THE SYNTHESIS OF (±)-GLAZIOVINE

Cesare Casagrande, Como, and Luigi Canonica, Milan, both of Italy, assignors to Siphar S.A., Lugano, Switzerland

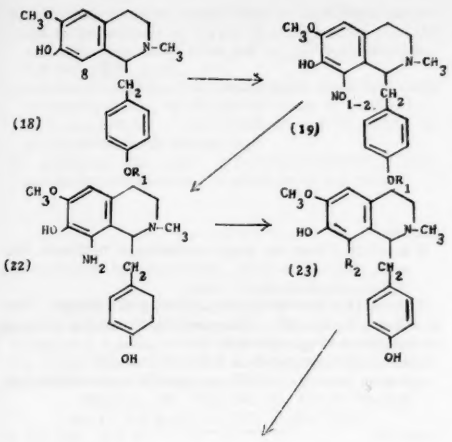
Filed Dec. 19, 1973, Ser. No. 426,185
Claims priority, application Switzerland, Dec. 22, 1972, 18784/72; Feb. 26, 1973, 2774/73
Int. Cl. C07d *35/28*
U.S. Cl. 260—289 R **11 Claims**

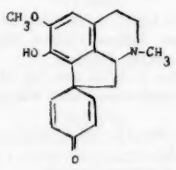
1. A method for the synthesis of (±)-glaziovine having the formula



(1)

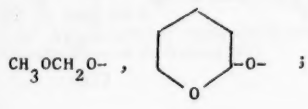
which provides for the following reaction pattern:

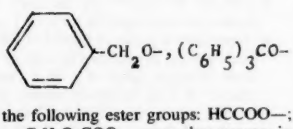




(1)

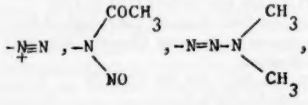
wherein OR_1 is an ether or ester group which can easily be split, such as for example the following ether groups:

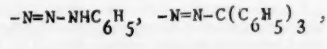




or analog groups, or the following ester groups: HCCOO—; CH_3COO—; CH_3SO_3—; C_2H_5O COO— or analog groups; in addition the group which is present in the 8-position of formula (19) can have either a single oxygen atom (—NO), thus representing a nitroso group, or two oxygen atoms ($—NO_2$), thus representing a nitro group, and R_2 is one of the following diazo groups:

—N N,





—N=N—NHC_6H_5, —N=N—$C(C_6H_5)_3$,

characterized by comprising the steps of:

a. subjecting either to nitration or nitrosation with either nitrous or nitric acid, respectively, or a derivative thereof, a 4′-O-ether or ester of 1-(p-hydroxybenzyl)-2-methyl-6-methoxy-7-hydroxy-1,2,3,4-tetrahydroisoquinoline of formula (18) selectively to obtain an 8-nitroso-, or an 8-nitro-derivative of formula (19);

b. converting said compound of formula (19) into its corresponding 8-amino-4′-hydroxy compound of formula (22) by reduction of either the nitroso or the nitro group to an amino group and removing the ether or ester group;

c. subjecting to reaction with nitrous acid the compound of formula (22) with the conventional methods in the art to obtain the compound of formula (23);

d. converting the compound of formula (23) into (±)-glaziovine.

3,886,167

2-ARYL-6-TRIFLUOROMETHYL-4-PYRIDYLCARBINOLAMINE ANTIMALARIALS

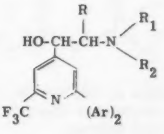
Arthur B. Ash, Detroit; Maurice P. LaMontagne, Sterling Heights, and Anica Markovac, Lathrup Village, all of Mich., assignors to The United States Government as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 6, 1974, Ser. No. 448,468

Int. Cl. C07d *29/28*

U.S. Cl. 260—293.52 **7 Claims**

1. Compound of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein $R + R_1$ is - $(CH_2)_4$-, where R_2 is H; and

$(Ar)_2$ is a phenyl ring substituted with at least one trifluoromethyl, chloro, bromo, fluoro or methoxy substituent in the phenyl ring.

3,886,168

N-SUBSTITUTED 1-AMINOMETHYLINDANES

Walter Himmele, Walldorf; August Amann; Werner Aquila, both of Ludwigshafen; Hubert Giertz, Limburgerhof, and Hardo Siegel, Speyer, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

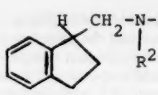
Filed July 20, 1972, Ser. No. 273,456

Claims priority, application Germany, July 26, 1971, 2137276

Int. Cl. C07d *29/10*

U.S. Cl. 260—293.62 **3 Claims**

1. A compound of the formula



in which R^1 and R^2 taken together with the nitrogen represent piperidino or piperidino substituted by lower alkyl; and pharmaceutically active salts thereof.

3,886,169
XANTHENYL AND THIAXANTHENYL SEMICARBAZIDES

Stewart Sanders Adams; Bernard John Armitage; Norman William Bristow, and Bernard Vincent Heathcote, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

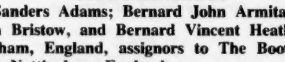
Continuation of Ser. No. 277,360, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 858,183, Sept. 15, 1969, Pat. No. 3,686,218, which is a continuation-in-part of Ser. No. 662,987, Aug. 23, 1967, Pat. No. 3,644,420. This application Dec. 12, 1973, Ser. No. 423,925

Claims priority, application United Kingdom, Sept. 2, 1966, 39384/66; Apr. 5, 1967, 15692/67; Sept. 27, 1968, 46085/68

Int. Cl. C07d *65/16;* **A61k** *27/00*

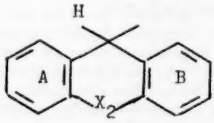
U.S. Cl. 260—293.58 **5 Claims**

1. A compound of formula I



...I

wherein Xn represents the group

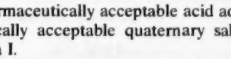


in which X_2 is oxygen or sulphur; the rings A and B may optionally contain substituents selected from halogen, lower alkyl, lower alkoxy and hydroxy;

R_1 is hydroxy, lower alkoxy, lower alkanoyloxy, hydrogen or lower alkyl;

R_2 is hydrogen or lower alkyl; and

R_3 and R_4, together with the nitrogen atom to which they are attached, form a saturated 5 – 7 membered heterocyclic ring, optionally containing an additional hetero group selected from O and



together with pharmaceutically acceptable acid addition salts and pharmaceutically acceptable quaternary salts of compounds of formula I.

3,886,170
5-(3-)SUBSTITUTED-10,11-DIHYDRO-5H-DIBENZ[B,F]AZEPINES

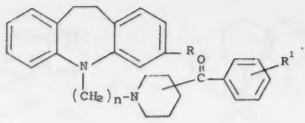
Grover Cleveland Helsley, Pottersville, N.J., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Apr. 22, 1974, Ser. No. 462,944

Int. Cl. C07d *29/26*

U.S. Cl. 260—293.59 **4 Claims**

1. A compound selected from 5-(3-)substituted-10,11-dihydro-5H-dibenz[b,f]azepines having the formula:



wherein;

R is selected from the group consisting of hydrogen, bromine, chlorine, methoxy, trifluoromethyl, sulfamoyl and N,N-dimethylsulfamoyl,

R^1 is selected from the group consisting of hydrogen, lower alkoxy, lower alkyl, trifluoromethyl and halogen having an atomic weight less than 80,

n is a positive integer from 2–4 inclusive, and

non-toxic pharmaceutically acceptable acid addition salts thereof.

3,886,171
1-(BENZAMIDO)PYRIDINIUM SALTS

John Henry Parsons. Saffron Walden, England, assignor to Fisons Limited, London, England

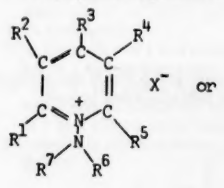
Filed Jan. 5, 1973, Ser. No. 321,476

Claims priority, application United Kingdom, Jan. 5, 1972, 369/72

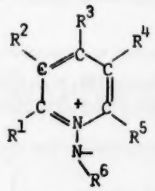
Int. Cl. C07d *31/44*

U.S. Cl. 260—295 Q **19 Claims**

1. A compound of general formula



(I)



(II)

in which

R^1, R^2, R^3, R^4 and R^5 are the same or different and each represents hydrogen or alkyl of 1 to 4 carbon atoms;

R^6 represents a group of formula COR^{10} in which R^{10} represents phenyl substituted by one or more groups selected from halogen, alkyl of 1 to 4 carbon atoms, nitro and alkoxy of 1 to 4 carbon atoms; phenylalkyl of 7 to 10 carbon atoms; phenylalkyl of 7 to 10 carbon atoms substituted by halogen; cycloalkyl of 3 to 8 carbon atoms;

R^7 represents hydrogen, alkyl of 1 to 4 carbon atoms or benzoyl substituted by halogen; and

X^- represents one equivalent of an acaracidally effective anion.

3,886,172
MANUFACTURE OF BIPYRIDYLIUM SALTS

John Francis Cairns, and John Reginald Case, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 10, 1972, Ser. No. 225,271

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 D **10 Claims**

1. A process for the manufacture of a 1,1'-di(hydroxylalkyl)-4,4'-bipyridylium salt wherein the hydroxyalkyl substituents each contain from 2 to 10 carbon atoms which comprises the steps of:

1. interacting pyridine with an alkali metal in liquid ammonia in the absence of oxygen to yield a solution of the corresponding alkali-metal salt of 1,1′,4,4′-tetrahydro-4,4′-bipyridyl;
2. reacting the solution thus obtained with an alkylene oxide containing from 2 to 10 carbon atoms to yield a 1,1′-di(hydroxyalkyl)-1,1′,4,4′-tetrahydro-4,4′-bipyridyl or an alkali-metal salt thereof; and
3. oxidising the said 1,1′-di(hydroxyalkyl-1,1′,4,4′-tetrahydro-4,4′-bipyridyl or alkali-metal salt thereof.

3,886,173
SUBSTITUTED HEXANITROBIPHENYLS

Joseph C. Dacons, Washington, D.C.; Horst G. Adolph, and Mortimer J. Kamlet, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 30, 1963, Ser. No. 334,667
Int. Cl. C07d *31/40;* **C07c** *85/06, 79/12*
U.S. Cl. 260—296 R **4 Claims**

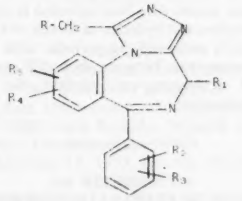
1. The compound which is the dipyridinium salt of dipicric acid.

3,886,174
1-SUBSTITUTED-6-PHENYL-4H-S-TRIAZOLO[4,3-A][1,4]BENZODIAZEPINES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 201,207, Nov. 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 138,278, April 28, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,453The portion of the term of this patent subsequent to Aug. 1, 1989, has been disclaimed.
Int. Cl. C07d *57/02*
U.S. Cl. 260—308 R **12 Claims**

1. A 1-substituted 6-phenyl-4H-s-triazolo[4,3-a][1,4]-benzodiazepine of the formula (III):



III

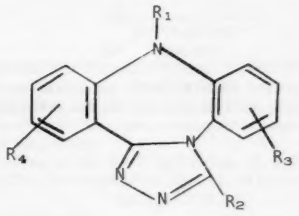
wherein R is selected from the group consisting of cyano, nitro, alkylthio in which the alkyl moiety is of 1 to 3 carbon atoms, inclusive, and —COOR″ in which R″ is alkyl defined as above; wherein R_1 is selected from the group consisting of hydrogen and alkyl, defined as above; and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, halogen, nitro, cyano, trifluoromethyl, and alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoylamino in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive, and dialkylamino in which alkyl is defined as above, and the pharmacologically acceptable acid addition salts thereof.

3,886,175
9H-DIBENZO(B,F)-S-TRIAZOLO(4,3-D)(1,4)DIAZEPINES

Jackson B. Hester, Jr., Galesburg, and Jacob Szmuszkovicz, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

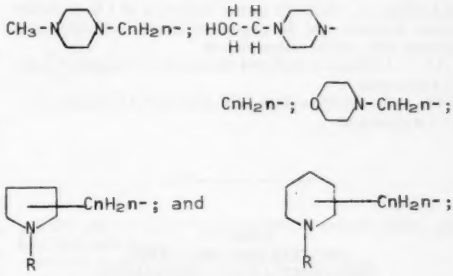
Continuation-in-part of Ser. No. 313,208, Dec. 8, 1972, Pat. No. 3,850,942, which is a continuation-in-part of Ser. No. 277,916, Feb. 22, 1972, abandoned. This application Feb. 11, 1974, Ser. No. 441,107
Int. Cl. C07d *57/02, 57/04, 99/02*
U.S. Cl. 260—308 R **19 Claims**

1. A compound selected from the group consisting of compounds of the formula III

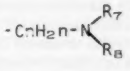


III

wherein R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 3 carbons, inclusive

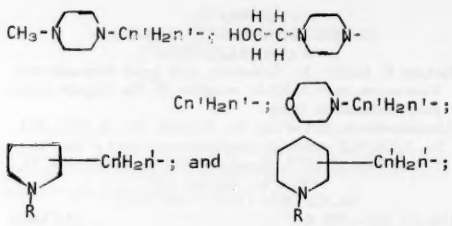


in which *n* is 1 to 4, inclusive, and R is hydrogen or alkyl defined as above, or R_1 is

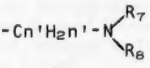


in which n is defined above, r_7 and R_8 are each selected from the group consisting of hydrogen and alkyl as defined above, or

together is pyrrolidino, or piperidino; wherein R_2 is selected from the group consisting of hydrogen, alkyl defined as above, hydroxymethyl,



in which n' is 0 to 4, inclusive, and R is hydrogen or alkyl defined as above, or R_2 is



in which n' is defined above, R_7 and R_8 are each selected from the group consisting of hydrogen and alkyl as defined above, or

together is pyrrolidino, or piperidino; wherein R_3 and R_4 are selected from the group consisting of hydrogen, fluoro, chloro, bromo, nitro, alkyl defined as above, trifluoromethyl, and alkoxy, in which the carbon moiety is of 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts and N-oxides thereof.

13. 3-(chloromethyl)-9H-dibenzo[b,f]-s-triazolo[4,3-d]-[1,4]diazepine.

17. 3-[2-(Chloroethyl)]-9H-dibenzo[b,f]-s-triazolo[4,3-d][1,4]diazepine.

3,886,176

PROCESS FOR PREPARING IMIDAZOLE-4,5-DICARBOXAMIDE

Yozo Ohtsuka, Kanagawa, Japan, assignor to Sagami Chemical Research Center, Tokyo, Japan

Filed Feb. 26, 1974, Ser. No. 446,087
Claims priority, application Japan, Feb. 26, 1973, 48-22145
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 **4 Claims**

1. A process for preparing imidazole-4,5-dicarboxamide which comprises heating diaminomaleonitrile and formic acid in formamide as a reaction medium at a temperature in the range of from about 150°C to about 220°C for a period of from about 10 minutes to about 10 hours in a molar ratio of about 1 to about 4 moles of formic acid per 1 mole of diaminomaleonitrile.

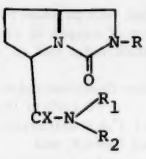
3,886,177

PYRROLO(1,2-C)IMIDAZOLE-3-ONE DERIVATIVES

Luigi Fontanella, Milan, and Emilio Occelli, Parabiago, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

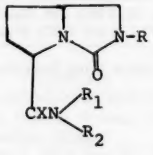
Filed Oct. 26, 1973, Ser. No. 409,984
Claims priority, application Italy, Nov. 3, 1972, 31273/72
Int. Cl.² C07D *49/34*
U.S. Cl. 260—309.7 **6 Claims**

1. A hexahydropyrrolo[1,2-c]imidazole derivative of the formula

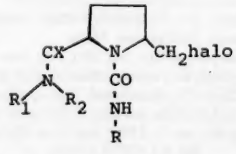


wherein R is a phenyl radical, R_1 and R_2 are independently selected from hydrogen, a lower alkyl, a phenyl and a benzyl radical, and wherein NR_1R_2 is a heterocyclic radical selected from pyrrolidino, morpholino, piperazino and piperidino having 0 to 2 lower alkyl substituent radicals and X represents H_2 or oxygen.

6. A process for preparing a hexahydropyrrolo[1,2-c]imidazole derivative of the formula



which comprises cyclizing a compound of the formula



wherein X is H_2 or O, R is a phenyl radical, R_1 and R_2 are independently selected from hydrogen, a lower alkyl, a phenyl and benzyl radical, and wherein NR_1R_2 is a heterocyclic radical selected from pyrrolidino, morpholino, piperazino and piperidino having 0 to 2 lower alkyl substituent radicals and halo is chloro or bromo, by heating the latter in the presence of a large molar excess of a base selected from amides, carbonates, hydroxides and hydrides of metals of Group I and of the alkaline earth metals of the periodic table in an organic solvent at a temperature between about 5°C. and reflux temperature and recovering as product the pyrrolo[1,2-c]imidazole derivative.

3,886,178

METHOD OF PREPARATION OF INDOLE

Marcel Petinaux; Jacques Metzger; Jean-Pierre Aune, all of Marseille, and Hubert Knoche, Meyzieu, all of France, assignors to Entreprise de Recherches et d'Activities Petrolieres ELF, Paris, France

Filed May 30, 1973, Ser. No. 365,110
Claims priority, application France, June 7, 1972, 72.20404
Int. Cl. C07d *27/56*
U.S. Cl. 260—319.1 **11 Claims**

1. A method of preparation of indole from N-(β-hydroxyethyl) aniline wherein, in a first step, the alcohol function of N-(β-hydroxyethyl) aniline is esterified with a mineral or an organic acid in an organic solvent which is inert with respect to the esterification reaction and at a temperature within the range of 0° to 200°C. and then, in a second step, the ester which has been prepared during the first step is subjected

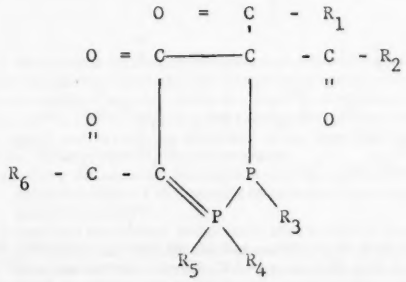
to thermal cracking at a temperature within the range of 650° to 900°C.

3,886,179
ORGANIC PHOSPHORUS COMPOUNDS CONTAINING AT LEAST ONE PHOSPHORUS ATOM, WHICH MAY BE PRESENT IN THE TRIVALENT STATE, AT LEAST TWO CARBOXYLIC ACID-ESTER GROUPS AND A PHOSPHORUS TO CARBON DOUBLE LINKAGE

Gunter Bergerhoff, Lengsdorf; Bela Tihanyi, Bonn; Jurgen Falbe, Dinslaken; Jurgen Weber, and Werner Weisheit, both of Oberhausen-Holten, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holten, Germany

Continuation-in-part of Ser. No. 772,841, Nov. 1, 1968, Pat. No. 3,681,477. This application May 8, 1972, Ser. No. 250,897
Claims priority, application Germany, Nov. 7, 1967, 1668623; Austria, July 15, 1968, 66801/68
Int. Cl. C07d *105/00*
U.S. Cl. 260—326.25 **3 Claims**

1. 1,2-diphosphacyclopentene-(5)-one-(4) of the formula:



wherein:

R_1, R_2, R_5 and R_6 is each an alkoxy group of 1–20 carbon atoms;

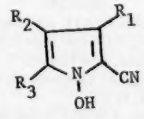
R_3 and R_4 is each a pyrrolidine-N radical.

3,886,180
PROCESS FOR THE SYNTHESIS OF N-HYDROXYPYRROLES

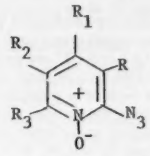
Rudolph Abraham Abramovitch, 480 Woodland Hills, Tuscaloosa, Ala. 35401, and Berkeley Wendell Cue, Jr., 14 B Belmont Apts., Tuscaloosa, Ala. 35401

Filed Mar. 15, 1973, Ser. No. 341,663
Int. Cl. C07d *27/26*
U.S. Cl. 260—326.62 **1 Claim**

1. A process for the production of an N-hydroxypyrrole-2-carbonitrile having the formula:



in which the symbol R_1 represents hydrogen, alkyl, aryl, nitrogen, halogen, or in which R_1 and R_2 or R_2 and R_3 comprise part of a fused ring system which is fused to the pyrrole nucleus between C_3 and C_4 or C_4 and C_5 which comprises thermally decomposing a compound having the formula:



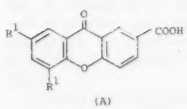
in which the symbols R_1 and R_2 and R_3 have the same meaning as defined and R represents hydrogen; said reaction being carried out in an inert solvent at a temperature of about 80°C to 100°C under an anhydrous atmosphere.

3,886,181
DISUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

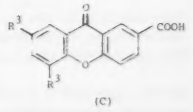
Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 217,300, Jan. 12, 1972, Pat. No. 3,821,251. This application Mar. 12, 1974, Ser. No. 450,351
Int. Cl. C07d *7/44*
U.S. Cl. 260—335 **15 Claims**

1. A compound selected from those represented by the following formulas:



(A)



(C)

and the pharmaceutically acceptable, non-toxic esters, amides, and salts thereof;

wherein each R^1 group is lower alkylthio; and

one R^3 group is lower alkylthio and the other is lower alkoxy.

3,886,182
RAPID SETTING NONELASTOMERIC POLYURETHANE COMPOSITIONS PREPARED IN THE PEESENCE OF AN AROMATIC OR PARTIALLY HYDROGENATED AROMATIC COMPOUND

Franciszek Olstowski, Freeport, and Donald B. Parrish, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 366,835, June 4, 1973, which is a continuation-in-part of Ser. No. 179,149, Sept. 9, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,465
Int. Cl. C08g *22/04*
U.S. Cl. 260—33.6 UB **29 Claims**

1. A non-elastomeric, non-cellular, solid polymer having a density of at least about 1 gram/cc and a present elongation of less than 80 resulting from admixture of the components of a composition comprising:

A. a polyether polyol having from 3 to about 8 hydroxyl groups and a hydroxyl equivalent weight between about 75 and about 230,

B. an organic polyisocyanate,

C. a liquid modifier compound having a boiling point above about 150°C selected from the group consisting of aromatic compounds free group ester groups and partially

hydrogenated aromatic compounds and mixtures thereof, and

D. a non-amine-containing catalyst for urethane formation, which is an organo-metal compound;

wherein components (A) and (B) are present in amounts so as to provide an NCO:OH ratio of from about 0.8:1 to about 2:1, component (C) is present in quantities of from about 20 to about 50 percent with the proviso that when component (B) is an NCO-containing prepolymer containing less than about 40% NCO groups by weight, then component (C) is employed in quantities of from about 10% to about 50% by weight of the sum of components (A), (B) and (C); and component (D) is present in quantities of from about 0.01 to about 10 percent by weight of the sum of the weights of components (A), (B) and (C); and wherein said polymer can be demolded within less than about 5 minutes, without the application of an external source of heat, after admixture of said composition.

3,886,183

PROCESS FOR PREPARING POLYCYCLIC 3-FORMYL GAMMA-PYRONE DERIVATIVES

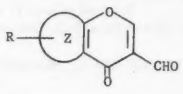
Maximilian von Strandtmann, Rockaway, and Sylvester Klutchko, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 351,915, April 18, 1973, abandoned. This application June 19, 1974, Ser. No. 480,984

Int. Cl. C07d *7/32*

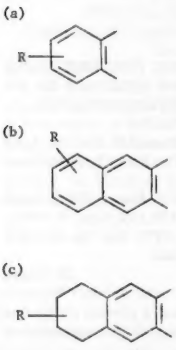
U.S. Cl. 260—345.2 **2 Claims**

1. A process for preparing a compound having the formula I:

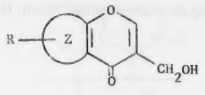


I

wherein R represents hydrogen, halogen, lower alkyl, or lower alkoxy and the Z ring has one of the following structures:



wherein R in formulas (a), (b), (c), (d) and (e) is as defined above, which comprises oxidizing a compound of the formula II:



II

wherein R and the Z ring are as defined above, using an oxidizing agent selected from the group consisting of sodium dichromateglacial acetic acid, concentrated nitric acid, and potassium persulfate.

3,886,184

AMINODIBENZO(B,D)PYRANS

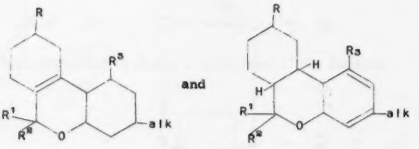
Ken Matsumoto, and Robert A. Archer, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 3, 1973, Ser. No. 385,367

Int. Cl. C07d *7/20*

U.S. Cl. 260—345.3 **7 Claims**

1. A compound of the formula of the group consisting of



wherein R, R^1 and R^2 are individually hydrogen or methyl, alk is a C_1–C_{10} alkyl group or a C_3–C_8 cycloalkyl group and R^3 is amino, lower alkyl amino, di-lower alkylamino, or lower alkanoyl amino.

3,886,185

NOVEL PROSTAGLANDIN INTERMEDIATES AND PROCESS FOR THE PRODUCTION THEREOF

Francisco S. Alvarez, Sunnyvale, and Albert R. Van Horn, Menlo Park, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 16, 1973, Ser. No. 351,312

Int. Cl. C07d *7/02;* **C07c** *61/06*

U.S. Cl. 260—345.9 **5 Claims**

1. A compound selected from the group consisting of (dl)-2-(2-acetoxyethyl-4α-hydroxy-1-oxocyclopent-2-ene and (dl)-2-(2-acetoxyethyl)-4α-tetrahydropyranyloxy-1-oxocyclopent-2-ene.

3,886,186

MONONITRATE ESTERS OF 1,4:3,6-DIANHYDRO-D-GLUCITOL

William Dvonch, Radnor, and Harvey E. Alburn, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 138,805, April 29, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 393,087

Int. Cl. C07d *5/32*

U.S. Cl. 260—347.2 **6 Claims**

1. A compound which is 1,4:3,6-dianhydro-D-glucitol, 5-acetate, 2-nitrate.

3,886,187
CONTINUOUS MANUFACTURE OF PROPYLENE OXIDE FROM PROPYLENE CHLOROHYDRINE

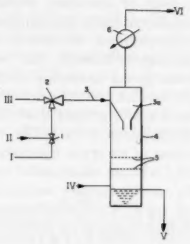
Ernst Bartholome, Heidelberg; Waldemar Koehler, Ludwigshafen; Guenter Stoeckelmann, Roxheim, and Albert May, Ludwigshafen, all of Germany, assignors to Badische Aniline- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 16, 1971, Ser. No. 199,319

Claims priority, application Germany, Nov. 16, 1970, 2056198

Int. Cl. C07d *1/04*

U.S. Cl. 260—348.6 **3 Claims**



1. In a process for the continuous manufacture of propylene oxide by reacting a hot aqueous solution of propylene chlorohydrin with hot aqueous alkali, at a reaction temperature of from 70° to 150° C.; stripping the reaction mixture by means of steam; and recovering propylene oxide from the steam phase, the improvement which comprises:

a. mixing the aqueous chlorohydrin with an aqueous alkali solution within 0.1 to 4 seconds by turbulent jet mixing at from 70° to 150°C.

b. injecting the mixture immediately after mixing by means of steam into a tubular reaction zone at such a velocity, that the formed two-phase mixture of steam and liquid has a residence time in the reaction zone of from 0.1 to 1 seconds,

c. conducting the reaction mixture from the reaction zone into the top of a separating column fitted with a dephlegmator, which is kept at such a temperature that only partial condensation occurs, stripping the liquid in the column with steam, which is introduced at the bottom of the column, and

d. recovering propylene oxide from the vapor phase leaving the dephlegmator.

3,886,188
PRODUCTION OF PURE 1-AMINO-4-NITROANTHRAQUINONE-2-CARBOXYLIC ACID

Alfred Schuhmacher, and Gerd Schwantje, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Sept. 20, 1973, Ser. No. 399,174

Claims priority, application Germany, Sept. 27, 1972, 2247347

Int. Cl. C09b *1/22*

U.S. Cl. 260—376 **6 Claims**

1. In a process for the production of pure 1-amino-4-nitroanthraquinone-2-carboxylic acid from 1aminoanthraquinone-2-carboxylic acid by reaction with formaldehyde in concentrated sulfuric acid, nitration of the reaction product to form 1,2-dihydro-6-nitro-7,8-diphthaloyl-3,1,4H-benzoxazone-4 followed by hydrolysis of the latter, the improvement which comprises:

precipitating the 1,2-dihydro-6-nitro-7,8-diphthaloyl-3,1,4H-benzoxazone-4 by adding, as the precipitant, water or a mixture of (a) water and (b) an organic solvent selected from the group consisting of alkanols of one or two carbon atoms, glycols and glycol monoalkyl ethers, the content of (b) being up to 30 percent by weight with reference to (a) + (b);

hydrolyzing the isolated precipitate in a reaction mixture consisting essentially of an aqueous solution of an alkali metal carbonate containing at least 1 mole of alkali per mole of benzoxazone; and

precipitating 1-amino-4-nitroanthraquinone-2-carboxylic acid from the resulting solution by acidification.

3,886,189
PROCESS FOR THE CONTINUOUS MANUFACTURE OF GRAFT POLYMERS

Ugo Nistri, Milan; Benito Busti, South Donato Milanese; Gianfranco Valoti, Sesto S. Giovanni; Vito Maron, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation of Ser. No. 98,081, Dec. 14, 1970, abandoned. This application Dec. 8, 1972, Ser. No. 313,386

Int. Cl.² C08F *1/13*

U.S. Cl. 260—880 R **7 Claims**

1. In a continuous graft copolymerization process for forming a graft copolymer of at least one vinyl monomer on an elastomer comprising continuously feeding to a reaction zone reactants comprising at least one vinyl monomer and and elastomer selected from the group consisting of polybutadiene, polyisoprene and a styrenebutadiene copolymer together with an emulsifier, a polymerization initiator and a molecular weight regulator; continuously graft copolymerizing, in homogeneous emulsion, said vinyl monomer onto said elastomer; and continuously recovering product graft copolymer, the improvement which comprises avoiding the formation of congealed material during the continuous process by:

(1) separately preparing an aqueous emulsion of said vinyl monomer containing from 40 to 60 weight percent water, said molecular weight regulator, said emulsifier and said polymerization initiator; and

(2) continuously separately feeding to a first stage of said reaction zone said separately prepared aqueous emulsion and said elastomer in the form of an aqueous latex thereof, maintaining the temperature in said first stage of 65° to 75°C., and regulating the level of discharge from said first stage so that the dwell time is between 1 and 4 hours; and

(3) supplying the product from said first stage to a second stage of said reaction zone arranged in series with said first stage, maintaining the temperature in said second stage, at 65° to 85°C., and regulating the dwell time therein so that the content of unreacted monomer is below 1 percent with respect to latex.

3,886,190
CARBOXY-TERMINATED BUTADIENE-VINYL FERROCENE COPOLYMERS

Samuel F. Reed, Jr., Holland, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 7, 1970, Ser. No. 95,889

Int. Cl. C08d *3/06*

U.S. Cl. 260—439 CY **1 Claim**

1. The carboxy-terminated copolymers of butadiene and vinyl ferrocene prepared by the method comprising reacting vinyl ferrocene and the initiator azobis(2-methyl-4 carboxy butyronitrile) in an inert organic solvent with butadiene at a reaction temperature and for a reaction time period sufficient for said reaction to take place after which solvent removal is effected and said copolymers are dried at a suitable drying temperature while under reduced pressure; said inert organic solvent being selected from dioxane and toluene; said reaction

temperature being in the range of about 60° to about 80°C; said reaction time being from about 24 hours to about 120 hours; said drying is accomplished at a suitable temperature in the range of about 70° to about 75°C; said reduced pressure is in the range of about 1 millimeter; said reacting butadiene and vinyl ferrocene in mole ratios from approximately 100:1 to 1:1 to form said copolymers characterized by a molecular weight in the range from about 1,000 to about 10,000, carboxy-end group content of about 0.5 weight percent to about 9 weight percent, and an iron content of about 0.5 weight percent to about 15 weight percent.

3,886,191

CARBOXY-TERMINATED COPOLYMERS OF ISOPRENE AND VINYL FERROCENE

Samuel F. Reed, Jr., Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 8, 1970, Ser. No. 56,015
Int. Cl. C08d *3/10*
U.S. Cl. 260—439 CY **1 Claim**

1. The carboxy terminated-copolymers of isoprene and vinyl ferrocene prepared by the method comprising reacting vinyl ferrocene and a suitable polymerization initiator in an inert organic solvent with isoprene at a reaction temperature and for a reaction time period sufficient for said reaction to take place after which solvent removal is effected and said copolymers are dried at a suitable drying temperature while under reduced pressure; said suitable polymerization initiator being 4,4′-azobis(4-cyanovaleric acid); said inert organic solvent being selected from dioxane and toluene; said reaction temperature being in the range of about 60°C to about 80°C; said reaction time being from about 24 hours to about 120 hours; said drying is accomplished at a suitable temperature in the range of about 70°C to about 75°C and said reduced pressure is in the range of about 1 millimeter; said reacting isoprene and vinyl ferrocene in mole ratios from approximately 100:1 to 1:1 to form said copolymers characterized by a molecular weight in the range from about 1000 to about 10,000, carboxy-end group content of about 0.5 weight percent to about 9 weight percent, and an iron content of about 0.5 weight percent to about 15 weight percent.

3,886,192

CARBOXY-TERMINATED COPOLYMERS OF CHLOROPRENE AND VINYL FERROCENE

Samuel F. Reed, Jr., Holland, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 7, 1970, Ser. No. 95,890
Int. Cl. C08d *3/14*
U.S. Cl. 260—439 CY **1 Claim**

1. The carboxy terminated-copolymers of chloroprene and vinyl ferrocene pprepared by the method comprising reacting vinyl ferrocene and chloroprene in the presence of a suitable polymerization initiator in an inert organic solvent at a reaction temperature and for a reaction time period sufficient for said reaction to take place after which solvent removal is effected and said copolymers are dried at a suitable drying temperature while under reduced pressure; said suitable polymerization initiator being 4,4′-azobis(4-cyanovaleric acid); said inert organic solvent being selected from dioxane and toluene; said reaction temperature being in the range of about 60°C to about 80°C; said reaction time being from about 24 hours to about 120 hours; said drying is accomplished at a suitable temperature in the range of about 70°C to about 75°C and said reduced pressure is in the range of about 1 millimeter; said reacting chloroprene and vinyl ferrocene in mole ratios from approximately 100:1 to 1:1 to form said copolymers characterized by a molecular weight in the range from about 1000 to about 10,000, carboxy-end group content of about 0.5 weight percent to about 9 weight percent, and an iron content of about 0.5 weight percent to about 15 weight percent.

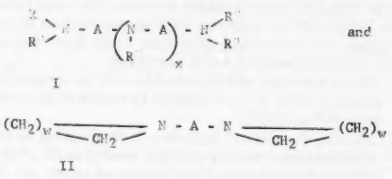
3,886,193

PREPARATION OF AROMATIC COMPOUNDS VIA BENZYNE INTERMEDIATES

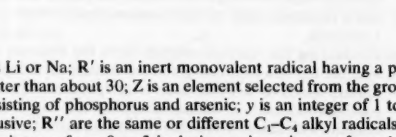
Thomas A. Whitney, Roselle, and Arthur W. Langer, Watchung, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 138,766, April 29, 1971, Pat. No. 3,787,496. This application Oct. 5, 1973, Ser. No. 404,022
Int. Cl. C07j *9/74, 9/28*
U.S. Cl. 260—440 **8 Claims**

1. A process for synthesizing substituted aromatic compounds characterized by the formula $Ar(ZR_2'-_y$, said process comprising reacting a halogenated aromatic compound, formula aromatic compound being one selected from the group consisting of derivatives of benzenes, naphthalenes, anthracenes, pyridines, naphthyridines, phenanthrenes, quinolines, paracyclophanes, quinoxalines, acridines, and binaphthyls, and substituted derivatives thereof, said substituents being ones selected from the group consisting of chlorine, bromine, fluorine, alkyl, dialkylamine and ethers, with the proviso that said substituents have a pK_a greater than 30 and do not undergo metalative decomposition by MZR_2' and do not interfere with the formation of an aryne intermediate, in the presence of excess HZR_2' with an alkali metal compound, having the formular MZR_2', and a tertiary amine selected from the group consisting of tris-(2-C_1–C_4-dialkylaminoethyl) amine, sparteine, C_1–C_4-dialkylbispidins, an amine containing bridgehead nitrogen,



and



II

M is Li or Na; R′ is an inert monovalent radical having a pK_a greater than about 30; Z is an element selected from the group consisting of phosphorus and arsenic; y is an integer of 1 to 6 inclusive; R″ are the same or different C_1–C_4 alkyl radicals; x is an integer from 0 to 3 inclusive; w is an integer from 1 to 5; A is a nonreactive radical selected from the group consisting of (1) cycloaliphatic radicals and their lower alkyl derivatives having ring structures containing from 4 to 7 carbon atoms, wherein said radicals are attached to the nitrogen atoms at 1, 2 or 1, 3 positions on the rings, and (2) 1 to 4 methylenic radicals inclusive, wherein each methylenic radical contains 0 to 2 monovalent hydrocarbon radicals of 1 to 6 carbon atoms; Ar is the aryl portion of the aromatic compounds defined hereinabove, at a temperature ranging from −50° to 150°C.

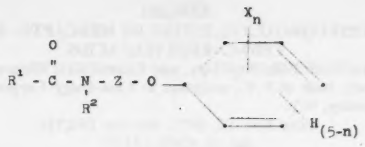
3,886,194

N-PHENOXYALKYL-L-THIOCYANOALKANAMIDES

Alfred A. Levin, Skokie, and Sidney B. Richter, Chicago, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 826,706, May 21, 1969, abandoned. This application Mar. 20, 1972, Ser. No. 236,299
Int. Cl.² C07C *161/02*
U.S. Cl. 260—454 **2 Claims**

1. A compound of the formula



wherein R^1 is lower thiocyanoalkyl; R^2 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkoxyalkyl, lower chloroalkyl and lower bromoalkyl; Z is an alkylene group of from one to four carbon atoms; X is selected from the group consisting of lower alkyl, lower alkenyl, chlorine, bromine, fluorine, lower alkoxy, lower alkylthio, nitro and di(lower alkyl)amino; and n is an integer from 0 to 3.

3,886,195

1-TRIFLUOROMETHYLPHENYL-2-CYANOALKYLAMINE PROPANE

Laszlo Beregi, Boulogne, Seine; Pierre Hugon, Rueil-Malmaison, and Jacques Duhault, Chatou, all of France, assignors to Science-Union et cie, Suresnes, France

Filed Jan. 17, 1973, Ser. No. 324,433

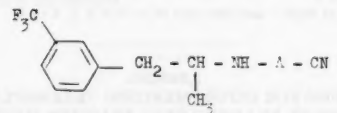
Claims priority, application United Kingdom, Feb. 7, 1972, 5557/72

Int. Cl. C07c *121/78*

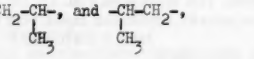
U.S. Cl. 260—465 E **5 Claims**

1. A compound selected from the group consisting of:

A. amino propane compounds of the general formula



wherein A is selected from the group consisting of: $-CH_2-$, $-CH_2-CH_2-$,



in racemic and optically active forms; and

B. physiologically tolerable acid addition salts thereof.

3,886,196

MAGNESIUM-ALUMINUM-SILICATE-PHOSPHATE CATALYSTS FOR AMMONIALYTIC CLEAVAGE OF LACTAMS TO FORM OMEGA-AMINONITRILES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 329,557, Feb. 7, 1973, abandoned, which is a continuation of Ser. No. 879,635, Nov. 24, 1969, abandoned. This application Dec. 3, 1973, Ser. No. 420,879

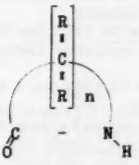
Int. Cl. C07c *121/02*

U.S. Cl. 260—465.2 **17 Claims**

1. A method for the conversion of lactam to the corresponding ω-aminonitrile which comprises contacting at least one lactam with a catalyst composition consisting essentially of magnesium-aluminum-phosphate-silicate on alumina, silica, or an alumina- or silica-containing substrate in the presence of at least about 1 mole of ammonia per mole of lactam converted and at elevated temperatures in the range of about 250° to 700° C sufficient to effect ammonialytic cleavage of said lactam to said ω-aminonitrile,

wherein in said catalyst composition said magnesium-aluminum-phosphate-silicate represents about 0.5 to 99.5 weight percent of said catalyst composition, the mole ratio of magnesium:aluminum ranges from about 99:1 to 1:99, and the mole ratio of silicate:phosphate ranges from about 99:1 to 1:99, such that a balance of cations:anions is effected in said magnesium-aluminum-phosphate-silicate,

wherein said lactam is represented by the formula



wherein *n* is an integer of 3 to about 9, R is hydrogen, or is alkyl, cycloal aryl, or combination thereof, having up to about 8 carbon atoms per R group with a maximum of about 10 carbon atoms in all R groups.

3,886,197

ORGANIC NITROGEN-FLUORINE COMPOUNDS AND THEIR PREPARATION

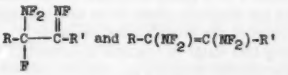
George N. Sausen, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1961, Ser. No. 137,507

Int. Cl. C07c *121/42, 121/60*

U.S. Cl. 260—465.5 R **20 Claims**

1. A compound of the group consisting of



wherein R and R′ are selected from the group consisting of hydrocarbon, halohydrocarbon, nitrohydrocarbon, carboxyhydrocarbon, halocarbonylhydrocarbyl, cyanohydrocarbyl, hydrocarbyloxycarbonylhydrocarbyl, carbamoylhydrocarbyl, hydrocarbylcarbamoylhydrocarbyl, dihydrocarbylcarbamoylhydrocarbyl, carboxyl, halocarbonyl, cyano, hydrocarbyloxycarbonyl, carbamoyl, hydrocarbylcarbamoyl and dihydrocarbylcarbamoyl, R and R′ each containing 1–12 carbons and being free of ethylenic unsaturation and of halogen of atomic number greater than 17, and, in the second formula, both not being alkyl simultaneously.

3,886,198

PROCESS FOR PREPARING IMINODIACETONITRILE

James E. Philbrook, Nashua, and Jon C. Thunberg, Amerst, both of N.H., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,445

Int. Cl. C07c *121/42, 121/02*

U.S. Cl. 260—465.5 A **8 Claims**

1. A process for preparing iminodiacetonitrile comprising preparing an aqueous mixture of hexamethylenetetramine HCN, and a strong acid selected from the group consisting of sulfuric acid, hydrochloric acid, and nitric acid, the aqueous mixture having a pH of 3–5 and a mole ratio of hexamethylenetetramine to HCN of 1:5–7, passing the aqueous mixture through a tubular reaction zone while maintaining the temper-

ature within the reaction zone at 50°–120°C, residence time in the reaction zone being 0.5–20 minutes, and recovering the iminodiacetonitrile.

3,886,199

MANUFACTURE OF DIESTERS OF DICARBOXYLIC ACIDS WITH SUBSTANTIAL WASTE WATER PURIFICATION

Hubert Suter; Rosemarie Berger, both of Ludwigshafen; Hansjoerg Bipp, Limbergerhof; Gert Buerger, Mannheim; Kurt Hauptmann, Hassloch; Otto Kratzer, Bobenheim-Roxheim, and Willi Reimer, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed June 18, 1973, Ser. No. 371,139

Claims priority, application Germany, June 21, 1972, 2230226

Int. Cl. C07c *69/34, 69/80*

U.S. Cl. 260—475 B **6 Claims**

1. In a continuous process for the manufacture of the diester of a dicarboxylic acid by esterification of a dicarboxylic acid component selected from the group consisting of phthalic anhydride, maleic anhydride and acids of the formula HOO-C—$(CH_2)_n$—COOH in which n is a whole number of 1 to 8 with an alcohol selected from the group consisting of butanol, n-octanol-1, n-octanol-2, 2-ethylhexanol-1, n-nonyl alcohol, decanol and isodecanol, esterification being carried out with recycling of the alcohol used in excess and in the absence of an esterification catalyst at a temperature of from 150° to 250° C and the reaction mixture being separated from the water of reaction, steamed out and then mixed with an aqueous alkali for separation of the monoester, the resulting aqueous monoester salt solution being acidified for the recovery of the monoester, the improvement which comprises:

treating the aqueous monoester salt solution after acidification with from 0.5 to 1 times its weight of the same alcohol as used in the ester synthesis;

separating the resulting mixture into alcoholic and aqueous phases and then extracting the separated aqueous phase with from 1 to 2 times its weight of the same alcohol;

recycling the alcoholic phase from said separation and said extraction to the esterification reaction;

combining said water of reaction separated from the esterification reaction mixture as a waste water with said aqueous phase resulting from the extraction step; and

removing the alcohol traces which remain in the resulting combined waste water and aqueous phase by blowing steam therethrough.

3,886,200

PROCESS FOR THE PREPARATION OF TEREPHTHALIC ACID DIMETHYLESTER

Ferdinand List; Helmut Alfs; Kurt Wember, all of Marl, and Friedrich-August Orlowski, Haltern, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Kreis Recklinghausen, Germany

Filed May 25, 1973, Ser. No. 364,085

Claims priority, application Germany, June 6, 1972, 2227396

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 R **8 Claims**

1. Process for the continuous esterification of terephthalic acid with methanol to the production of terephthalic acid dimethyl ester, which comprises bringing together into an original dispersion, at a temperature of from 300° to 350° C., methanol vapor and powdered terephthalic acid and vaporized terephthalic acid dimethyl ester, the latter in an amount ranging from 50 to 100 molar percent based on the amount of powdered terephthalic acid in said original dispersion, and immediately conducting the dispersion through a fixed bed of esterification catalyst in lump form.

3,886,201

PERFLUOROALKYL ESTERS OF MERCAPTO- AND THIO-CARBOXYLIC ACIDS

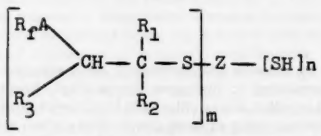
Robert Allan Falk, New City, and Eduard Karl Kleiner, New York, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,715

Int. Cl. C07c *153/07*

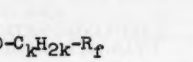
U.S. Cl. 260—481 R **12 Claims**

1. A compound of the formula



wherein

R_1, R_2 and R_3 are hydrogen, methyl, R_fA or R_fACH_2 and where at least one of R_1, R_2 and R_3 is R_fA or R_fACH_2, R_f is a perfluoroalkyl group of 2 to 18 carbon atoms, R_fA is



Z is

$C(CH_2OOCCH_2CH_2)_4$

$C(CH_2OOCCH_2)_4$

$CH_3C(CH_2OOCCH_2CH_2)_3$

$CH_3C(CH_2OOCCH_2)_3$

$CH_3CH_2C(CH_2OOCCH_2CH_2)_3$

$CH_3CH_2C(CH_2OOCCH_2)_3$

$—O—CH_2—C—(CH_2OOCCH_2)_3]_2$ or

$—O—CH_2—C(CH_2OOCCH_2CH_2)_3\ ]_2$

k is 1 or 2

m is at least 1 and the sum of $m + n$ is 3, 4 or 6

3,886,202

METHOD FOR DEPOLYMERIZING THERMOPLASTIC RESINS BY LIQUID HEAT TRANSFER MEDIA

Takeichi Tatsumi, Tokyo; Hiroshi Yoshihara, Chiba, and Gaisuke Uesaka, Mihara, all of Japan, assignors to Kabushiki Kaisha Denshikagaki, Hiratsuka, Japan

Continuation-in-part of Ser. No. 144,867, May 9, 1971, abandoned. This application Feb. 12, 1974, Ser. No. 441,804

Claims priority, application Japan, May 19, 1970, 45-42680

Int. Cl. C07c *69/54*

U.S. Cl. 260—486 R **3 Claims**

1. A process for thermally decomposing an acrylic resin, characterized in that the acrylic resin is thermally decomposed by bringing it into direct contact with a liquid heat transfer medium consisting of one or more salts of alkali metals.

3,886,203

3-HYDROXYACYL AMINOMETHYL-5-ACYLAMINO-2,4,6-TRIIODOBENZOIC ACID SALTS AS X-RAY CONTRAST AGENTS

Ernst Felder, and Davide Pitre, both of Milan, Italy, assignors to Bracco Industria Chimica, Societa per Axioni, Milan, Italy

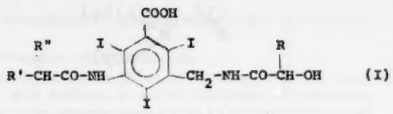
Filed June 24, 1974, Ser. No. 482,666

Claims priority, application Switzerland, July 17, 1973, 10449/73

Int. Cl. C07c *103/32*

U.S. Cl. 260—501.11 **7 Claims**

1. A compound which is a 3-hydroxyacylaminomethyl-5-acylamino-2,4,6-triiodobenzoic acid of the formula



(I)

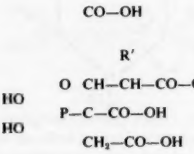
wherein
R and R'' are hydrogen or methyl,
R' is hydrogen or hydroxyl,
R' is hydroxyl when R is hydrogen, and
R'' is hydrogen when R' is hydrogen; or
a water-soluble, physiologically tolerated sodium or alkanolamine salt of said acid.

3,886,204
2-PHOSPHONO-BUTANE-1,2,3,4-TETRACARBOXYLIC ACIDS

Hans Geffers, Cologne; Walter Radt; Hartmut Schultz, both of Leverkusen, and Reinhard Schliebs, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 202,564, Nov. 26, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,549
Claims priority, application Germany, Dec. 16, 1970, 2061838
Int. Cl. C07f 9/38
U.S. Cl. 260—502.4 R **2 Claims**

1. 2-phosphono-butane-1,2,3,4-tetracarboxylic acid compounds of the formula



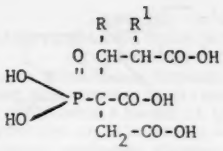
in which
R' is hydrogen or methyl,
and the alkali metal and ammonium salts thereof.

3,886,205
2-PHOSPHONO-BUTANE-1,2,4-TRICARBOXYLIC ACIDS

Hans Geffers, Cologne; Walter Radt; Hartmut Schulz, both of Leverkusen, and Reinhard Schliebs, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 202,564, Nov. 26, 1971, abandoned. This application Feb. 11, 1974, Ser. No. 441,550
Claims priority, application Germany, Dec. 16, 1970, 2061838
Int. Cl. C07f 9/38
U.S. Cl. 260—502.4 R **5 Claims**

1. 2-phosphono-butane-1,2,4-tricarboxylic acid compounds of the formula



(I)

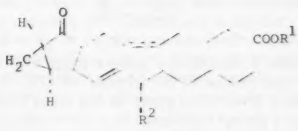
in which
R is hydrogen or lower alkyl, and
R' is hydrogen or methyl,
and the alkali metal and ammonium salts thereof.

3,886,206
10,11-METHYLENE-SUBSTITUTED PHOSTAGLANDIN DERIVATIVES

Pierre Crabbe, and Pierre Vogel, both of Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sept. 8, 1972, Ser. No. 287,242
Int. Cl. C07c 64/74, 61/36
U.S. Cl. 260—514 D **5 Claims**

1. A compound selected from the group of those represented by the formula:



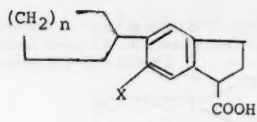
wherein R^1 is hydrogen or lower alkyl; R^2 is selected from the group consisting of hydroxy, methoxy, ethoxy, cyclopentoxy, tetrahydrofuran-2-yloxy, tetrahydropyran-2-yloxy, 4-methoxytetrahydropyran-4-yloxy, a hydrocarbon carboxylic acyloxy group containing from 1 to 12 carbon atoms or a substituted hydrocarbon carboxylic acyloxy having from 1 to 12 carbon atoms wherein the substituent is selected from the group consisting of hydroxy, alkoxy containing up to six carbon atoms, hydrocarbon carboxylic acyloxy containing up to twelve carbon atoms, nitro, amino and halogen; the dotted bond line between the C-5 and C-6 position indicates that the bond joining the C-5 and C-6 position is a saturated ethylene bond or a cis-olefin double bond; and the pharmaceutically acceptable salts of the above compounds wherein R^1 is hydrogen.

3,886,207
PROCESS FOR PRODUCING INDAN-1-CARBOXYLIC ACID DERIVATIVES

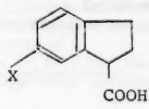
Shoji Kishimoto, Osaka; Tetsuya Aono, Kyoto, and Shunsaku Noguchi, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed June 19, 1973, Ser. No. 371,527
Claims priority, application Japan, June 26, 1972, 47-63902
Int. Cl. C07c 63/44
U.S. Cl. 260—515 A **10 Claims**

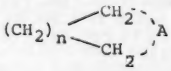
1. A process for producing a compound of the general formula



wherein X represents a halogen atom, and n is 1 or 2, or pharmaceutically acceptable salts thereof, which comprises reacting a compound of the general formula:



wherein X is as defined above, with a compound of the general formula:



wherein *n* is as defined above, and A represents —CH=CH— or

and wherein Y represents a halogen atom, hydroxyl group or sulfonic acid residue of the formula —OSO_2—R, wherein R represents a lower alkyl group having up to 4 carbon atoms, phenyl or a phenyl substituted by a lower alkyl group, in the presence of a Friedel-Crafts type catalyst or an inorganic acid.

3,886,208

N-ALKYLATION OF ACYLATED AMINO COMPOUNDS

Eva Birgitta Akerblom, Uppsala, Sweden, assignor to Pharmacia Aktiebolag, Uppsala, Sweden

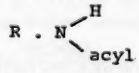
Continuation of Ser. No. 98,855, Dec. 16, 1970, abandoned. This application Dec. 15, 1972, Ser. No. 315,691

Claims priority, application Sweden, Dec. 23, 1969, 17859/69

Int. Cl. C07c *101/54*

U.S. Cl. 260—518 R **7 Claims**

1. In the known process of the N-alkylation of acylated amino compounds of the formula

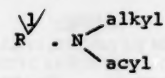


(I)

wherein R represents a member selected from the group consisting of alkyl, aryl and aralkyl groups, said groups being unsubstituted and alkyl, aryl and aralkyl groups, said groups being substituted, and 'acyl' represents a member selected from the group consisting of alkanoyl and benzoyl, by reaction with di-(alkyl)sulfate having the formula

alkyl . O . SO_2 . O . alkyl

wherein 'alkyl' is an alkyl group containing from 1 to 5 carbon atoms, to form a compound of the formula III



(III)

wherein R^1 represents a member selected from the group consisting of the same organic residue as R above, and alkylated R, and 'alkyl' and 'acyl' each have the same significance as above, the improvement which consists of bringing together the reactants with dimethylsulfoxide under alkaline reaction conditions and at a sufficient temperature to substitute the alkyl group of the alkylating agent for the hydrogen of the compound of the formula I.

3,886,209

PROCESS FOR PREPARING ALPHA, OMEGA-DIAMINOCARBOXYLIC ACIDS

Ryoji Kikumoto; Masahiro Ito; Akio Nakamura, and Tatsuo Nomura, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

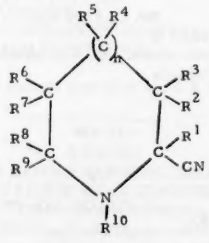
Filed Nov. 20, 1972, Ser. No. 307,900

Claims priority, application Japan, Nov. 19, 1971, 46-92838

Int. Cl. C07c *99/08*

U.S. Cl. 260—534 R **13 Claims**

1. A process for producing an α,ω-diaminocarboxylic acid which comprises contacting a 2-cyano 5- or 6-membered saturated cyclic amine as defined by the following formula (new formula)



wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8 and R^9 each represents hydrogen, a lower alkyl group having 1 to 6 carbon atoms, or a phenyl or lower alkyl substituted phenyl group, R^{10} represents hydrogen or a lower alkyl group and *n* is 0 or 1, at a temperature from 40° to 250°C., with 1–1,000 moles of H_2O, 1–100 moles of NH_3 and 1–50 moles of CO_2, per mole of 2-cyano 5- or 6-membered saturated cyclic amine, to obtain a reaction product containing 5- (ω-aminoalkyl) hydantoin, and hydrolyzing said reaction product.

3,886,210

UREA SYNTHESIS WITH IMPROVED HEAT RECOVERY AND AMMONIUM CARBAMATE RECIRCULATION

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y.

Continuation-in-part of Ser. No. 50,777, June 29, 1970, Pat. No. 3,759,992. This application June 13, 1973, Ser. No. 369,756The portion of the term of this patent subsequent to Sept. 18, 1990, has been disclaimed.

Int. Cl. C07c *127/00*

U.S. Cl. 260—555 A **12 Claims**

1. In an urea synthesis process wherein a first aqueous urea solution comprising urea, ammonium carbamate, ammonia

and water is produced at elevated temperature and elevated pressure,

the improvement which comprises:

a. reducing said pressure of, and heating, said first aqueous urea solution in a first carbamate decomposing zone to decompose from about 10 to about 60 percent by weight of the ammonium carbamate therein to NH_3 and CO_2 gas,

b. then heating said heated first aqueous urea solution in a second carbamate decomposing zone to decompose additional ammonium carbamate to NH_3 and CO_2 gas, and to produce a liquid phase comprising urea, water, residual ammonium carbamate and residual excess ammonia, and a gaseous phase comprising CO_2, NH_3 and H_2O;

c. separating said gaseous phase and said liquid phase;

d. contacting said gaseous phase, urea and fresh CO_2 to form ammonium carbamate in indirect heat exchange with said first aqueous urea solution, whereby heat of reaction released in forming said ammonium carbamate in (d) provides heat for (a), the quantity of urea so contacted being such that the reaction product has a ratio of urea to water of from about 0.1/1 to about 1.6/1.

3,886,211

CARBOXYLIC ACID HYDRAZIDE DERIVATIVES

John Francis Edmund Keenan, Cheadle Hulme, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

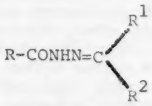
Continuation-in-part of Ser. No. 881,282, Dec. 1, 1969, abandoned. This application Mar. 5, 1970, Ser. No. 16,971

Claims priority, application United Kingdom, Dec. 10, 1968, 58503/68

Int. Cl. C07c *103/30*

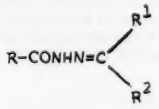
U.S. Cl. 260—561 H **5 Claims**

1. A carboxylic acid hydrazide compound of the formula



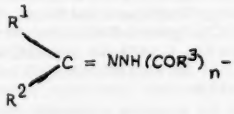
wherein R is an alkyl group having from 1 to 12 carbon atoms, R^1 is hydrogen or an alkyl group having from 1 to 12 carbon atoms, and R^2 represents the group —CH=NNHCOR, wherein R is as defined above.

2. A carboxylic acid hydrazide compound of the formula



I

wherein R represents a group of the formula



II

in which R^1 is hydrogen or an alkyl group having from 1 to 12 carbon atoms, R^2 is an alkyl group having from 1 to 12 carbon atoms, R^3 is an alkylene residue having from 1 to 12 carbon atoms or a vinylene residue, and *n* is 1.

3,886,212

PROCESS FOR PREPARING N,N,N',N'-TETRAACETYL COMPOUNDS

Gerhard Künstle, Raitenhaslach; Heilmuth Spes, Burghausen, and Herbert Siegl, Haiming, all of Germany, assignors to Wacker-Chemie GmbH, 8 Munich 22, Germany

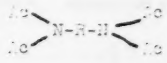
Filed Feb. 11, 1974, Ser. No. 441,200

Claims priority, application Germany, Feb. 19, 1973, 2308119

Int. Cl. C07c *103/44*

U.S. Cl. 260—561 R **8 Claims**

1. In a process for preparing N,N,N',N'-tetraacetyl compounds of the general formula

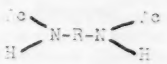


wherein

Ac represents acetyl —$OCCH_3$,

R represents a straight or branch chained alkylene group with 1 – 12 C-atoms, or equals zero;

or R represents substituted or unsubstituted phenylene, benzylidene, cyclohexylidene, naphthylene, diphenylene methane or dicyclohexylidene methane group, by N-acetylation of N,N'-diacetyl compounds of the formula



wherein Ac and R have the meaning indicated above, with ketene in the presence of a catalyst and a solvent, the improvement of using as catalyst an inorganic fluorine compound of an element which is selected from the group consisting of boron, silicon, nitrogen, phosphorus, arsenic, antimony, bismuth, titanium, and vanadium, and a mixture of said elements.

3,886,213

PREPARING AND STORING OF REDUCED COPPER CATALYST

John Allan Fetchin; William Frank Marzluff, and William Austin Barber, all of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 7, 1973, Ser. No. 395,301

Int. Cl. C07c *103/08*

U.S. Cl. 260—561 N **18 Claims**

1. In the catalytic hydration of a nitrile with water to produce a corresponding amide wherein the catalysts for said hydration is reduced copper, selected from the group consisting of reduced copper sulfate, reduced Adkins catalyst, Raney copper, and Urushibara copper the improvement wherein the copper catalyst is one that has been separated from the reduction medium and subsequently washed with aqueous alkali metal nitrite solution while the reduced copper catalyst is still freshly reduced.

3,886,214
BENZODIAZEPIN-2-ONES AND PROCESSES FOR THE PREPARATION THEREOF

Joseph Hellerbach, Basel, Switzerland, and Armin Walser, West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

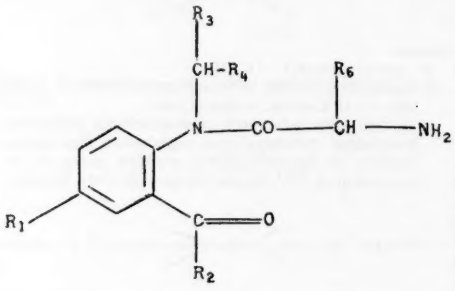
Division of Ser. No. 169,564, Aug. 4, 1971, Pat. No. 3,784,542, which is a continuation-in-part of Ser. No. 10,053, Feb. 9, 1970, abandoned. This application July 9, 1973, Ser. No. 377,880

Claims priority, application Switzerland, Feb. 14, 1969, 2255/69

Int. Cl. C07c *103/32*

U.S. Cl. 260—562 N **2 Claims**

1. A compound of the formula



wherein R_1 signifies halogen or nitro; R_2 signifies phenyl, mono-halo phenyl or pyridyl; R_3 signifies hydrogen, lower alkyl, hydroxy-lower alkyl, halo-lower alkyl, acyloxy-lower alkyl, carbalkoxy, mono-lower alkylamine-lower alkyl, or di-lower alkylamino-lower alkyl; R_4 signifies lower alkoxy, halo-lower alkoxy, amino-lower alkoxy, mono-lower alkylamino-lower alkoxy, di-lower alkylamino-lower alkoxy, hydroxy-lower alkoxy, alkoxy-lower alkoxy, lower alkylthio, loweralkylsulfinyl or lower alkylsulfonyl and R_6 signifies hydrogen or carbalkoxy, R_4 being other than amino-lower alkylamino-lower alkoxy or di-lower-alkylamino-lower alkoxy in case R_3 stands for carbalkoxy.

3,886,215
PROCESS USING METAL SALT-AMINE COMPLEX CATALYSTS FOR THE PREPARATION OF ALPHA BETA-ETHYLENIC KETONES SUCH AS DELTA-CIS-PSEUDO IONONES

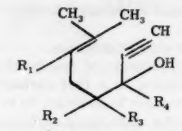
Robert S. Desimone, Willingboro, and Peter S. Gradeff, Andover, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,559

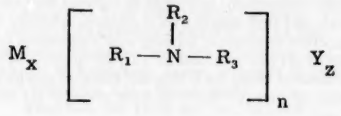
Int. Cl. C07c *45/00*

U.S. Cl. 260—586 C **25 Claims**

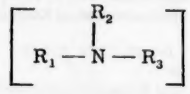
1. A process for preparing cis-Δ^3-pseudo ionones and cis-Δ^3-pseudo-methyl ionones from dehydrolinalool and lower alkyl homologues thereof by condensation with an isopropenyl or isobutenyl lower alkyl ether, comprising condensing dehydrolinalool or a lower alkyl homologue thereof having the formula:



wherein R_1, R_2, R_3, and R_4 are hydrogen or lower alkyl having from one to about four carbon atoms and with an isopropenyl or isobutyl lower alkyl ether in the presence of a metal salt-amine complex catalyst of the formula:



wherein M is a metal selected from the group consisting of copper, chromium and silver, Y is the anion of the salt and is selected from the group consisting of chloride, bromide, iodide, nitrate, and sulphate; x and z are integers selected according to the valence of M and Y, n is a number within the range from about 0.01 to about 50, and



is selected from the group consisting of aliphatic hydrocarbon amines, cycloaliphatic hydrocarbon amines, cycloaliphatic aliphatic hydrocarbon amines, monocarbocyclic aromatic amines, and heterocyclic amines in which two or three of R_1, R_2 and R_3 are taken together to form a heterocyclic ring, which may include nitrogen, oxygen, and sulfur hetero atoms; R_1, R_2 and R_3, taken singly or together, being hydrocarbon groups having from one to about 30 carbon atoms or hydrogen, the condensation being carried out at a reaction temperature within the range from about 80° to about 150°C, thereby obtaining a cis-Δ^3-pseudo ionone or a cis-Δ^3-pseudo methyl ionone.

3,886,216
PROCESS FOR THE PREPARATION OF ALFA BETA-ETHYLENIC KETONES

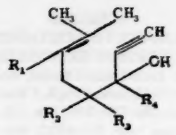
Robert S. DeSimone, Willingboro, and Peter S. Gradeff, Andover, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,560

Int. Cl. C07c *49/20*

U.S. Cl. 260—593 R **15 Claims**

1. A process for preparing cis-pseudo ionones and cis-pseudo methyl ionones from dehydrolinalool and lower alkyl or alkenyl derivatives thereof by condensation with an isopropenyl or isobutenyl lower alkyl ether, comprising condensing dehydrolinalool or a lower alkyl or alkenyl derivative thereof having the formula:



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, lower alkyl and lower alkenyl having from one to about four carbon atoms and an isopropenyl or isobutyl lower alkyl ether in the presence of cupric nitrate at a reaction temperature within the range from about 10° to about 150°C., thereby obtaining a cis-Δ^3-pseudo ionone or a cis-Δ^3-pseudo methyl ionone.

3,886,217

PROCESS FOR THE PREPARATION OF ALPHA, BETA-THYLENIC KETONES SUCH AS DELTA^3-CIS-PSEUDO IONONES

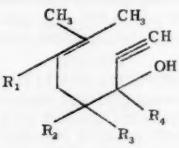
Robert S. Desimone, Willingboro, and Peter S. Gradeff, Andover, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,558

Int. Cl. C07c *49/20*

U.S. Cl. 260—593 R **14 Claims**

1. A process for preparing cis-Δ^3-pseudo ionones and cis-Δ^3-pseudo methyl ionones from dehydrolinalool and lower alkyl or alkenyl derivatives thereof by condensation with an isopropenyl or isobutenyl lower alkyl ether, comprising condensing dehydrolinalool or a lower alkyl or alkenyl derivative thereof having the formula:



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen, lower alkyl and lower alkenyl having from one to about four carbon atoms and an isopropenyl or isobutyl lower alkyl ether in the presence of cupric sulfate at a reaction temperature within the range from about 80° to about 150°C., thereby obtaining a cis-Δ^3-pseudo ionone or a cis-Δ^3-pseudo methyl ionone.

3,886,218

PROCESS FOR THE PRODUCTION OF DIHYDROXYDIPHENYLETHERS

Efim Biller, Fribourg, Switzerland; Fritz-Peter Schmook, Vienna, Austria, and Bernd Haas, Wesseling, Germany, assignors to Union Rheinische Braunkohlen kraftstoff Aktiengesellschaft, 5047 Wesseling, Germany

Filed July 19, 1973, Ser. No. 380,535

Claims priority, application Germany, Aug. 1, 1972, 2237762

Int. Cl. C07c *41/00*

U.S. Cl. 260—613 R **3 Claims**

1. A process for the production of dihydroxydiphenylether, which comprises reacting a hydroquinone or an alkylhydroquinone having one or two alkyl groups with up to 3 carbon atoms at temperatures of from 50° to 250°C in the presence of a natural or synthetic aluminum silicate as catalyst in an inert solvent or a mixtures of solvents selected from the group consisting of dodecane, lower alkyl benzenes, chloro benzenes, diphenylethers, hydrocarbons having 2 or 3 phenyl groups combined with at least 2 methyl or methylene groups and mineral oil fractions of a corresponding boiling range, separating the catalyst from the reaction product, removing the unreacted hydroquinone by co-distillation with the said solvent and recovering the 4,4'-dihydroxydiphenylether by vacuum distillation of the remaining bottom product in the presence of a solvent selected from the group consisting of divinylbenzene, triphenyldiether and mineral oil fractions of a corresponding boiling range, and separating the crystallised ether from the distillate.

3,886,219

PROCESS FOR PREPARING SATURATED ALCOHOLS

Manfred Reich, Marl, Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Continuation of Ser. No. 791,178, Jan. 14, 1969, abandoned. This application July 6, 1972, Ser. No. 269,480

Int. Cl. C07c *29/14*

U.S. Cl. 260—638 B **13 Claims**

1. In a process for preparing a saturated alcohol by catalytically hydrogenating at least one member selected from the group consisting of alkenones, alkanones, alkanals, alkenals, alkadienals and mixtures thereof in the vapor phase at a temperature of 100°–220° C. in the presence of a catalyst support consisting of solid silica gel, said support being impregnated with activating metal selected from the group consisting of copper, nickel and mixtures thereof, the content of the activating metal being 1–25% by weight based on the total weight of the support and the activating metal,

the improvement which comprises using said silica gel support having a surface pH of 6–10, said silica gel support being a solid having a surface area of about 100 to 400 m^2/g and a bulk density of about 350 to 600 g/l prior to the impregnation step and retaining essentially the same surface pH of said silica gel support after the catalyst is produced.

3,886,220

AVOIDING POLLUTION BY HF CATALYST RESIDUES

Cecil O. Carter, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1973, Ser. No. 392,233

Int. Cl. C07c *17/08*

U.S. Cl. 260—653.6 **8 Claims**

1. A process in which a used HF acid alkylation catalyst is treated in two stages to recover the HF values and react recovered HF with olefins to obtain alkyl fluorides which process comprises the steps of:

a. contacting used HF acid catalyst in a first stage stripping zone with a hot hydrocarbon stripping medium under conditions sufficient to form an overhead stream comprising HF, water vapor and hydrocarbon stripping vapor and yield a heavy liquid residue of acid-soluble oil,

b. passing said overhead stream to a second stage stripping zone operated under refluxing conditions to produce a second overhead stream comprising HF and hydrocarbon stripping medium and a bottoms stream comprising condensed water containing HF, and

c. reacting said bottoms stream comprising condensed water containing HF with an olefin under conditions to form an alkyl fluoride.

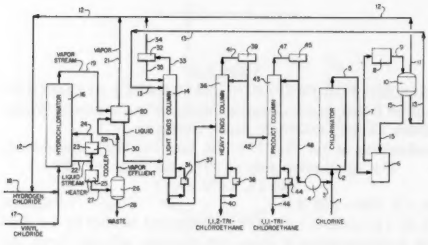
3,886,221
PRODUCTION OF CHLORINATED HYDROCARBONS

Robert B. Agee, Baker, and James E. Davis, Baton Rouge, both of La., assignors to Ethyl Corporation, Richmond, Va.

and a continuation-in-part of Ser. No. 196,803, Nov. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 750,833, Aug. 7, 1968, abandoned. This application Mar. 14, 1974, Ser. No. 451,180

Int. Cl. C07c *17/00*

U.S. Cl. 260—658 R 5 Claims



1. In a process for producing substantially pure 1,1,1-trichloroethane which includes the concurrent formation of a liquid hydrochlorination product stream and a liquid chlorination product stream, said liquid hydrochlorination product stream being predominantly 1,1-dichloroethane produced in a catalytic hydrochlorination zone by the reaction of vinyl chloride and hydrogen chloride at from about 50° to about 250°F and at a pressure up to 300 psig followed by separation of vapors, polymers and catalyst from the hydrochlorination products; and said liquid chlorination product stream being primarily 1,1,1-trichloroethane and 1,1-dichloroethane produced in a chlorination zone by the reaction of chlorine and 1,1-dichloroethane at from about 600° to about 800°F and at a pressure up to 300 psig followed by removal of vapor from the chlorination product and coincident distilling of said liquid hydrochlorination product stream and said liquid chlorination product stream together in a distillation zone to yield the substantially pure 1,1,1-trichloroethane, the improvement which comprises producing said liquid hydrochlorination product stream for distillation by:

1. withdrawing from the hydrochlorination zone a vapor stream and a liquid stream, the vapor stream containing 1,1-dichloroethane, hydrogen chloride and vinyl chloride, and the liquid stream containing 1,1-dichloroethane, polymer and catalyst;
2. cooling a part of the liquid stream in a cooling zone and recycling this cooled part back to the hydrochlorination zone;
3. heating the remainder of the liquid stream to form a vapor effluent containing 1,1-dichloroethane and a liquid effluent containing polymer and catalyst;
4. separating the liquid effluent from the vapor effluent; and
5. combining the separated vapor effluent and the aforesaid vapor stream in a condensation zone wherein the combined vapors are partially condensed to yield said liquid hydrochlorination product stream which is predominantly 1,1-dichloroethane for said coincident distillation.

3,886,222
PROCESS FOR OBTAINING 1,1,1,2-TETRACHLOROETHANE

Yves Correia, and Jean-Claude Strini, both of Saint-Auban, France, assignors to Rhone-Progil, Courbevoie, France

Continuation of Ser. No. 786,740, Dec. 24, 1968, abandoned. This application Mar. 17, 1972, Ser. No. 235,777

Claims priority, application France, Dec. 29, 1967, 134294/67

Int. Cl. C07c *17/04*

U.S. Cl. 260—658 R 3 Claims

1. A process for the preparation of 1,1,1,2-tetrachloroethane comprising reacting 1,1-dichloroethylene in the liquid phase in the presence of 1,1,1,2-tetrachloroethane with molecular chlorine at a temperature within the range of 20°–90°C in the absence of light and in the absence of a catalyst, wherein the molar ratio of chlorine to 1,1-dichloroethylene is within the range of 0.8 to 0.95 and wherein the 1,1-dichloroethylene contains less than 0.001% by weight of a stabilizer.

3,886,223
ISOMERIZATION OF ISOPROPYLNAPHTHALENE ALKYLATE MIXTURES

Herbert Rudolph Conrad Kemme, Flemington, and Edward Jonathan Scharf, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 1, 1974, Ser. No. 465,966

Int. Cl. C97c *5/28, 15/24*

U.S. Cl. 260—668 A 2 Claims

1. A process for increasing the beta isopropylnaphthalene content of a mixture containing essentially naphthalene, alpha and beta isopropylnaphthalene and diisopropylnaphthalene, which comprises contacting said mixture with a rare earth metal exchanged, synthetic, crystalline "Y" type aluminosilicate catalyst at a temperature of from about 200°C. to 325°C., a space velocity of from about 0.1 to 4 hour^{-1}, and a pressure of from about 200 psig to 500 psig, said mixture having an equivalent naphthalene to equivalent propylene ratio of from about 1 to 10.

3,886,224
CONVERSION OF NON-CYCLIC C_3–C_5 ALKANES TO AROMATIC HYDROCARBONS

Maurice M. Mitchell, Jr., Wallingford, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 324,720, Jan. 18, 1973. This application May 6, 1974, Ser. No. 467,025The portion of the term of this patent subsequent to Apr. 22, 1992, has been disclaimed.

Int. Cl. C07c *3/02*

U.S. Cl. 260—673 5 Claims

1. In a method for the single stage conversion of non-cyclic C_3–C_5 alkanes to aromatic hydrocarbons having twice the number of carbon atoms as the alkane converted wherein said alkane is characterized by being capable of being dehydrogenated to an olefin having an allylic hydrogen atom and wherein said alkane is contacted with a physical admixture of particles of supported bismuth oxide dehydrodimerization agent and particles of a chromia-alumina catalyst said contacting being at a temperature in the range of from 570° to 650°C., the improvement comprising employing an essentially non-segregating particulate admixture of said supported bismuth oxide and said chromia-alumina at a weight ratio of supported bismuth oxide to chromia-alumina of about 1:1 said supported bismuth oxide particles and chromia-alumina particles being of substantially the same density and having a mesh size of from 20 to 50 and wherein the weight ratio of chromia-alumina to bismuth oxide alone is about 8.4:1 to 4.6:1.

3,886,225
PROCESS FOR THE CATALYTIC OLIGOMERIZATION OF 1,3-DIOLEFINS TO FORM OPEN-CHAIN COMPOUNDS

Guenther Wilke, and Paul Heimbach, both of Mulheim/Ruhr, Germany, assignors to Studiengesellschaft Kohle GmbH, Mulheim A.D. Ruhr, Germany

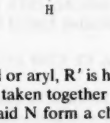
Division of Ser. No. 252,395, May 11, 1972, which is a continuation of Ser. No. 816,159, April 7, 1969, abandoned, which is a continuation of Ser. No. 582,224, Sept. 27, 1966, abandoned. This application Aug. 10, 1973, Ser. No. 387,269

Claims priority, application Germany, Sept. 28, 1965, 24437

Int. Cl. C07c *3/10*

U.S. Cl. 260—677 R **11 Claims**

1. Process of oligomerizing olefins with at least two carbon-carbon double bonds in conjugation to form open chain acyclic oligomeric products thereof which comprises carrying out said oligomerization in the presence of a composition comprising at least one carbonyl free 0-valent nickel complex compound having 1 to 4 electron donor constituents selected from the group consisting of compounds which contain non-benzenoid carbon-carbon unsaturation, alkyl phosphines, aryl phosphines, alkyl phosphites and aryl phosphites, and morpholine or an amine of the formula



wherein R is cycloalkyl or aryl, R′ is hydrogen, alkyl, cycloalkyl or aryl or R and R′ taken together form an alkylene group which, together with said N form a closed ring, wherein said amine is present in said composition in a proportion in excess of any amine bondable to said nickel in said 0-valent complex.

3,886,226
POLYURETHANE COMPOSITION

Kiyotsugu Asai, Kawasaki; Toshihiko Kawabata; Koichi Sakai, both of Tokyo; Kiyo Fukuda, Yokohama; Seiji Nagahisa, Kawasaki, and Toshiyuki Ichikawa, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Feb. 20, 1973, Ser. No. 333,540

Claims priority, application Japan, Mar. 28, 1972, 47-30283

Int. Cl. C08g *22/04*

U.S. Cl. 260—77.5 AM **4 Claims**

1. A polyurethane mixed composition of:

A. polyurethane composition A selected from the group consisting of

1. a polyurethane composition prepared by reacting in a solvent a polyisocyanate, a polyoxytetramethylene glycol or a polyester glycol which has hydroxyl groups at its terminals, a low molecular weight chain-elongating agent and an aminosilane compound, and

2. a polyurethane composition prepared by mixing an adhesive composition prepared by reacting in a solvent an aminosilane compound and an isocyanate, with a polyurethane elastomer prepared by reacting in a solvent a polyisocyanate, a polyoxytetramethylene glycol or a polyester glycol which has hydroxyl groups at its terminals, and a low molecular weight chain-elongating agent; and

B. polyurethane composition B selected from the group consisting of

1. a polyurethane composition prepared by reacting in a solvent a polyisocyanate, a polyoxyalkylene glycol other than polyoxytetramethylene glycols, a low molecular weight chain-elongating agent and an aminosilane compound, and

2. a polyurethane composition prepared by mixing an adhesive composition prepared by reacting in a solvent an aminosilane compound and an isocyanate, with a polyurethane elastomer prepared by reacting in a solvent a polyisocyanate, a polyoxyalkylene glycol other than polyoxytetramethylene glycols and a low molecular weight chain-elongating agent,

wherein each said low molecular weight chain-elongating agent is selected from the group consisting of a glycol, an amino-alcohol, a diamine and mixtures thereof, each said aminosilane is selected from the group consisting of N-β-(aminoethyl)-γ-aminopropyltrimethoxysilane, N-β-(aminoethyl)-γ-aminopropyltriethoxysilane, γ-aminopropyltrimethoxysilane and γ-aminopropyltriethoxysilane and is used in an amount of from 0.01 to 5.0% by weight based on solids content of the polyurethane composition in which it is contained, each said polyisocyanate is selected from the group consisting of 2,4-tolylenediisocyanate, 2,6-tolylenediisocyanate, 4,4-diphenylmethanediisocyanate, 3,3-dimethyl-4,4′-diphenylmethanediisocyanate, 1,5-naphthylenediisocyanate, 1,6-hexamethylenediisocyanate and 4,4′-dicyclohexylmethanediisocyanate and mixtures thereof, and each said isocyanate is selected from the group consisting of a polyisocyanate, a polyphenylene polymethylene polyisocyanate, phenyl isocyanate, o- and p-tolylisocyanates, o- and p-chlorophenyl isocyanates and mixtures thereof, said polyurethane composition B being present in an amount of from 0.0001 to 1 part per part of polyurethane composition A based on solids content.

3,886,227
GRAFTED POLYOLEFINS AS MODIFYING AGENTS FOR UNGRATED POLYOLEFINS

Robert A. VanBrederode, and Robert A. Steinkamp, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 240,468, April 3, 1972, abandoned. This application Dec. 4, 1972, Ser. No. 311,582

Int. Cl. C08f *29/12*

U.S. Cl. 260—836 **3 Claims**

1. The method of improving the properties, including crystallization rates, of a composition comprising nongrafted crystallizable polypropylene which comprises:

a. incorporating into said crystallizable polypropylene from 0.1 to 15 weight percent of a modifying agent consisting essentially of a grafted polyolefin wherein said graft component comprises 0.1 to 15 weight percent of acrylic acid or glycidyl acrylate,

b. melting said crystallizable polypropylene, and

c. cooling the resulting blend to the temperature of crystallization of said blend and thus forming very small sperulites because of the presence of said modifying agent,

wherein said composition also contains impact components selected from the group consisting of olefin elastomers, polyethylenes and combinations thereof.

3,886,228
POLYURETHANE COMPOSITION CURABLE WITH POLYAMINE/ACID ANHYDRIDE ADDUCT

Justin C. Bolger, Dover, Mass., assignor to Amicon Corporation, Lexington, Mass.

Filed June 3, 1974, Ser. No. 475,763

Int. Cl. C08g *22/04, 30/10, 41/04*

U.S. Cl. 260—858 **17 Claims**

1. A curable polyurethane resin composition comprising a polyisocyanate and as a curing agent therefor a condensation product obtained by reacting, with removal of an equimolecular proportion of water, approximately equimolecular proportions of an amine selected from the group consisting of diethylenetriamine and triethylenetetramine with an anhydride

selected from the group consisting of phthalic anhydride, hexahydrophthalic anhydride, maleic anhydride and succinic anhydride, said condensation product having a melting point from 75° to 130°C., the amount of said condensation product being at least enough to provide primary and secondary amino hydrogen atoms equivalent to the total number of isocyanate groups present.

3,886,229

SHAPED POLYMERIC ARTICLES

Francis Gowland Hutchinson, Lymm; Richard George Cleveland Henbest, Frodshum, and Margaret Kenley Leggett, Northwich, all of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 60,614, Aug. 3, 1970, abandoned. This application July 17, 1972, Ser. No. 272,715

Claims priority, application United Kingdom, Aug. 21, 1969, 41844/69; May 11, 1970, 22167/70

Int. Cl.[2] C08G *41/04*

U.S. Cl. 260—859 R **17 Claims**

1. A polymeric product formed from

a. 5 percent to 95 percent by weight of the precursors of a linear polyurethane consisting of at least one diisocyanate and at least one difunctional compound free from ethylenic unsaturation and containing two groups reactive with isocyanate groups, each unit derived from the difunctional compound in the polymeric product providing an average of not more than 35 in-chain atoms in the macromolecular chains of said product, and said difunctional compound being selected from the group consisting of diols, diacids, and low molecular weight condensates thereof, and

b. 95 percent to 5 percent by weight of the precursors of a cured polyester resin consisting of

i. at least one ethylenically unsaturated polyester containing in each molecule at least two groups reactive with isocyanate groups, and

ii. at least one monomer copolymerizable with the ethylenically unsaturated groups in the polyester, the proportion of ethylenically unsaturated polyester to monomer copolymerizable therewith being in the range 70%:30% to 10%:90% by weight, the molar proportion of isocyanate groups in the diisocyanate to groups reactive with isocyanate groups in the difunctional compound plus groups reactive with isocyanate groups in the ethylenically unsaturated polyester being in the range 0.8:1 to 1.2:1, said polymeric product being formed by a reaction of the precursors of the linear polyurethane together and with the ethylenically unsaturated polyester and by copolymerization of the monomer with the ethylenically unsaturated groups in the polyester.

3,886,230

POLYESTER BLENDS CONTAINING A DI(HYDROXYALKYL) AMINE MODIFIED POLYESTER

Erich Marcus, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 6, 1973, Ser. No. 413,318

Int. Cl. C08g *39/02*

U.S. Cl. 260—860 **22 Claims**

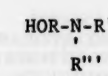
1. A polyester blend of a uniform mixture of:

A. from 2.5 to 25 weight percent of modified polyester and

B. from 75 to 97.5 weight percent of fiber-forming conventional polyester of a diol and a dicarboxylic acid; said modified polyester being the condensation product of:

a. a dicarboxylic acid or alkyl ester thereof, and

b. a di(hydroxyalkyl)amine having at least three carbon atoms between the hydroxyl group and the nitrogen atom of the formula:



wherein R is a divalent alkylene of from 3 to 8 carbon atoms; R′ is an —ROH group or R″; R″ is an alkyl or aralkyl group having from 2 to 8 carbon atoms or a cycloalkyl group having 5 or 6 ring carbon atoms; and R‴ is R″, an

group or an

group.

3,886,231

THERMOPLASTIC COMPOSITIONS CONTAINING METHACRYLONITRILE POLYMER

Eric Nield, Ware, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 669,379, Sept. 21, 1967, abandoned. This application July 31, 1973, Ser. No. 384,292

Claims priority, application United Kingdom, Oct. 7, 1966, 45052/66

Int. Cl. C08f *29/56*

U.S. Cl. 260—876 R **6 Claims**

1. A thermoplastic blend of a resin which is a polymer consisting essentially of methacrylonitrile and 0 up to a total of 10% molar of at least one ethylenically unsaturated monomer selected from the group consisting of alkenes, conjugated aromatic olefins, esters of acrylic and methacrylic acids, vinyl esters, and a compatible graft polymer having a diene rubber substrate containing 40 to 100% molar of at least one conjugated diene monomer and from 60 to 0% molar of at leaste one other ethylenically unsaturated monomer copolymerizable therewith and a superstrate which is an acrylonitrile polymer containing 60 to 90% molar of acrylontrile and 40 to 10% of at least one ethylenically unsaturated monomer selected from the group consisting of alkenes, conjugated aromatic olefins, esters of acrylic and methyacrylic acids and vinyl esters, the blend comprising from 1% to 50% by weight of the diene rubber.

3,886,232

PROCESS FOR PRODUCING VINYL CHLORIDE RESIN COMPOSITION

Takashi Tanaka; Haruhiko Yusa, and Susumu Chubachi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 295,577, Oct. 6, 1972, Pat. No. 3,842,144. This application July 17, 1974, Ser. No. 489,836

Claims priority, application Japan, Oct. 7, 1971, 46-78996; May 22, 1972, 47-50549

Int. Cl. C08d *9/10*; **C08f** *15/00, 14/00*

U.S. Cl. 260—876 R **4 Claims**

1. A method for producing vinyl chloride resin composition having excellent impact strength, weather resistance, and processability which consists essentially of uniforming blending:

95 to 70 parts by weight of a vinyl chloride polymer selected from the group consisting of homopolymers of vinyl chloride, and copolymers of vinyl chloride containing therein more than 70percent by weight of vinyl chloride, and 5 -

30 parts by weight of a multi-component type resin which is produced by the following steps:

a. preparing a latex of a rubber polymer by polymerizing a monomer mixture selected from the group consisting of a mixture of 40 to 95percent by weight of acrylic acid alkyl ester, 5 to 40percent by weight of butadiene, and 0.1 to 30percent by weight of methylmethacrylate in the presence of from 0.01 to 3percent by weight of crosslinking agent, said polymer latex containing from 50 to 75 parts by weight of said rubber polymer;

b. adding to said latex from 50 to 25 parts by weight of styrene and methylmethacrylate in a ratio of 90 to 10percent by weight of styrene, 10 to 90percent by weight of methylmethacrylate and 0.01 to 3percent by weight of a crosslinking agent copolymerizable with said monomers;

c. dividing said monomer components into first and second grafting components, said first grafting component being composed of styrene and methylmethacrylate with styrene as the principal constituent and containing therein the crosslinking agent, and said second grafting component being composed of methylmethacrylate alone and containing therein the crosslinking agent;

d. adding said first grafting component to said crosslinked copolymer rubber latex to be graft-polymerized thereupon;

e. further adding said second grafting component to said graft-polymerized copolymer latex to be further grafted thereupon and

f. recovering the multi-component type resin from said graft-polymerized latex through the processes of salting out, dehydration and drying.

3,886,233

PROCESS FOR THE PREPARATION OF GRAFT POLYMERS

Marinus J. R. Visseren, Geleen, Netherlands, assignor to Stamicarbon, N.V., Geleen, Netherlands

Filed Apr. 7, 1972, Ser. No. 242,233

Claims priority, application Netherlands, Apr. 10, 1971, 7104841

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 R **19 Claims**

1. Process for preparing graft copolymers by polymerizing, in the presence of a radical-forming initiator, at least one monomer selected from the class consisting of:

A. styrene, α-methyl-styrene, monochlorostyrene, dichlorostyrene, ethyl styrene, vinyltoluene, vinyl-xylene, and mixtures thereof;

B. acrylonitrile, methacrylonitrile, methylacrylate, methylmethacrylate, ethylacrylate, ethylmethacrylate, propylacrylate, propylmethacrylate, butylacrylate, butylmethacrylate, 2-ethylhexylacrylate, and mixtures thereof; and

C. mixtures of A and B;

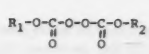
in the presence of a rubber-like largely saturated polymer containing:

i. ethylene, from about 19 to about 73 weight percent;

ii. at least one alkene, having from 3 to 6 carbon atoms, about 23 to about 77 weight percent; and

iii. at least one multiply unsaturated monomer, from about 4 to about 20 weight percent;

said polymerization conducted at a temperature of about 30 to about 230°C and in the presence of a peroxydicarbonate radical-forming initiator of the formula:



wherein R_1 and R_2 are independently hydrocarbon groups having from 1 to 30 carbon atoms either substituted or not.

3,886,234

ADHESIVE RESIN COMPOSITIONS AND ADHESIVE FILMS PRODUCED THEREFROM

Shigenobu Ishihara, and Shoichi Kobayashi, both of Tokyo, Japan, assignors to Showa Denka Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1973, Ser. No. 349,579

Claims priority, application Japan, Apr. 8, 1972, 47-34850; Dec. 1, 1972, 47-119786; Dec. 27, 1972, 47-130059

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 R **36 Claims**

1. An adhesive composition consisting essentially of (A) 100 parts by weight of (1) an ethylene-vinyl acetate copolymer or (2) a combination of an ethylene-vinyl acetate copolymer and polyethylene, the vinyl acetate content in (A) being 1 to 35 percent by weight based on the total weight of said copolymer or said combination of the copolymer and polyethylene, (B) 0.05 to 200 parts by weight of at least one unsaturated carboxylic acid which is solid at normal temperature, (C) 0.005 to 10.0 parts by weight of at least one organic peroxide having a decomposition temperature as determined by 10 hour half life of greater than 60°C.

3,886,235

PROCESS FOR PRODUCING VINYL CHLORIDE RESIN COMPOSITION

Takashi Tanaka; Haruhiko Yusa, and Susumu Chubachi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 295,577, Oct. 6, 1972, Pat. No. 3,842,144. This application Mar. 27, 1974, Ser. No. 455,349

Claims priority, application Japan, Oct. 7, 1971, 46-78996; May 22, 1972, 47-50549

Int. Cl. C08d *9/10*; **C08f** *15/00, 14/00*

U.S. Cl. 260—880 R **3 Claims**

1. A method for producing a multi-component type resin as an impact modifier for blended vinyl chloride resin composition having excellent impact strength, weather-resistance, and processability, which comprises steps of:

a. emulsion-polymerizing in the presence of a polymerization catalyst a monomer mixture selected from the group consisting of a mixture of 60 to 95% by weight or acrylic acid alkyl ester and 5 to 40% by weight of butadiene, and a mixture of 40 to 95% by weight of acrylic acid alkyl ester, 5 to 40% by weight of butadiene, and 0.1 to 30% by weight of methylmethacrylate in the presence of from 0.01 to 3% by weight of a cross-linking agent selected from the group consisting of divinyl benzene, divinyl toluene, ethylene glycol dimethacrylate, diethylene glycol dimethacrylate, and triethylene glycol dimethacrylate to produce a cross-linked copolymer rubber latex;

b. providing monomer component in a quantity of 50 to 25 parts by weight, which component consists of 10 to 90% by weight of styrene, 90 to 10% by weight of methylmethacrylate, and 0.01 to 3% by weight of a cross-linking agent selected from the group consisting of divinyl benzene, divinyl toluene, ethylene glycol dimethacrylate, diethylene glycol dimethacrylate, and triethylene glycol dimethacrylate;

c. dividing said monomer components into first and second grafting components, said first grafting component being composed of styrene and methylmethacrylate with styrene as the principal constituent and containing therein the cross-linking agent, and said second grafting compo-

nent being composed of methylmethacrylate alone and containing therein the cross-linking agent;

d. adding said first grafting component to 50 to 75 parts by weight of said cross-linked copolyer rubber latex to be graft-polymerized thereupon;

e. further adding said second grafting component to said graft-polymerized copolymer rubber latex to be further grafted thereupon; and

f. recovering the multi-component type resin from said graft-polymerized rubber latex through the process steps of acid depositon, salting-out, dehydration, or desiccation.

3,886,236

HALOGENATED ESTERS OF PHOSPHORUS-CONTAINING ACIDS

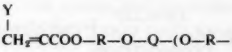
Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Continuation-in-part of Ser. No. 179,543, Sept. 10, 1971, Pat. No. 2,780,144, which is a continuation of Ser. No. 785,335, Dec. 19, 1968, abandoned. This application July 30, 1973, Ser. No. 383,583

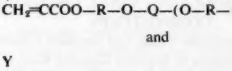
Int. Cl. C07f *9/08*

U.S. Cl. 260—952 **26 Claims**

1. A phosphorus-halogen-containing compound having a formula selected from the class consisting of



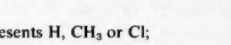
and



wherein

Y represents H, CH_3 or Cl;

Q represents



X represents Cl or Br;

R represents a divalent hydrocarbon radical of 1–20 carbon atoms;

R′ represents H, X or R″; and

R″ represents a monovalent hydrocarbon radical of 1–20 carbon atoms.

3,886,237

HALOGENATED PHOSPHONATES

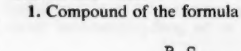
Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Continuation-in-part of Ser. No. 179,543, Sept. 10, 1971, Pat. No. 3,780,144 which is a continuation of Ser. No. 785,335, Dec. 19, 1968, abandoned. This application July 30, 1973, Ser. No. 383,513

Int. Cl. C07f *9/40, 9/22*

U.S. Cl. 260—956 **9 Claims**

1. A phosphorus-halogen-containing compound having the formula



wherein

X represents Cl or Br;

R represents a divalent hydrocarbon radical of 1–20 carbon atoms;

R′ represents H, X or R″; and

R″ represents a monovalent hydrocarbon radical of 1–20 carbon atoms.

3,886,238

S,S-DIALKYL-N-SUBSTITUTED PHOSPHOROAMIDODITHIONITES

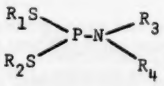
Francis J. Freenor, III, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 219,559, Jan. 20, 1972, Pat. No. 3,832,424. This application May 2, 1974, Ser. No. 466,433

Int. Cl. C07f *9/24;* **A01n** *9/36*

U.S. Cl. 260—959 **9 Claims**

1. Compound of the formula



wherein R_1 and R_2 are independently alkyl of 1 to 8 carbon atoms or alkenyl of 2 to 8 carbon atoms, R_3 is hydrogen or alkyl of 1 to 4 carbon atoms and R_4 is acyl of 2 to 4 carbon atoms.

3,886,239

PROCESS FOR PREPARING TRIS (2-HALOALKYL) PHOSPHITES

Philip M. Pivawer, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 283,973, Aug. 25, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 400,386

Int. Cl. C07f *9/08*

U.S. Cl. 260—977 **9 Claims**

1. In a process for preparing a tris(2-haloalkyl)phosphite by the reaction of a phosphorus trihalide, in which the halogen is chlorine, bromine or a mixture thereof, with an alkylene oxide having a 1,2-epoxide ring in the presence of a tertiary amine hydrohalide catalyst, the improvement which comprises carrying out said reaction in the presence of ethylene dichloride solvent.

3,886,240

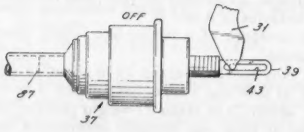
CARBURETOR ACCELERATOR PUMP CONTROL APPARATUS

Frede Baldin, Plymouth, and George Nastas, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,822

Int. Cl.[2] F02M *7/08*

U.S. Cl. 261—34 B **4 Claims**



1. In an internal combustion engine having a carburetor including an induction passage, a throttle valve pivotally mounted within said induction passage, an accelerator pump

to inject fuel into said induction passage, linkage means interconnecting said accelerator pump and said throttle valve so that movement thereof results in actuation of the accelerator pump,

a manifold vacuum responsive and temperature sensitive means having a movable element cooperable with said linkage means to limit the displacement thereof in response to throttle valve opening when the sensed temperature exceeds a predetermined magnitude,

said linkage having elements including a first lever movable with said throttle valve,

a second lever that actuates the accelerator pump,

a resilient member and a solid link interconnecting said first and second levers, said resilient member being preloaded so as to act as a solid member until the second lever reaches the end of its travel,

said manifold vacuum responsive and temperature sensitive means including a housing,

said movable element having a slot formed therein extending longitudinally in the direction of movement of said movable element, said movable element being retractable so that said slot is partially received within said housing, said movable element being protracted and said one element of said linkage means being movable within the full length of said slot upon an acceleration when the temperature is below said predetermined magnitude,

said movable element being retracted and said one element of said linkage means being movable within the exposed portion of said slot upon an acceleration when the temperature exceeds said predetermined magnitude.

3,886,241

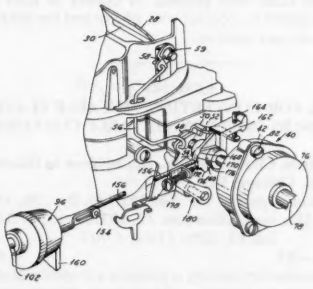
CARBURETOR COLD ENRICHMENT CONTROL

Phillip A. Schubeck, Woodhaven, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 6, 1974, Ser. No. 448,795

Int. Cl. F02m *7/24*

U.S. Cl. 261—39 B **13 Claims**



1. A cold engine enrichment control for use in a carburetor having an air/fuel induction passage open at one end to clean air at essentially atmospheric pressure and connected to an engine intake manifold at the opposite other end to be subject to the changes in engine vacuum, a throttle valve mounted for movement across the other end between closed and fully open positions to control the flow of fuel and air through the passage, and a choke valve anterior of the throttle valve mounted for movement across the one end between closed and open inoperative positions to control the flow of air into the passage, the control including first means operably connected to the choke valve and operable above a predetermined temperature upon the engine attaining a running condition to move the choke valve to an open inoperative position to increase airflow and decrease emissions, and second temperature responsive means operably positioned in the path of closing movement of the throttle valve and variably movable as a function of temperature changes independently of the first means to restrict the closing movement of the throttle valve to maintain the throttle valve open to a beyond normal engine idle speed position to increase the flow of the air/fuel mixture, to prevent engine stallings.

3,886,242

METHOD FOR FORMING HOLES IN CONCRETE SLABS AND PAVEMENTS

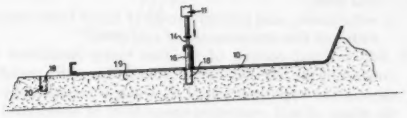
Matthews McGregor, West Bridgford, England, assignor to Robert McGregor & Sons Limited, Chesterfield, Derkyshire, England

Filed Apr. 23, 1973, Ser. No. 353,360

Claims priority, application United Kingdom, May 1, 1972, 20100/72

Int. Cl. E04b *1/16*

U.S. Cl. 264—31 **1 Claim**



1. A method of forming a hole in a concrete slab or pavement comprising the steps of positioning a finishing plate in overlying contact with wet laid concrete to finish form said slab or pavement, said plate having at least one through aperture, forcing a plug from above the plate through and guided by said aperture into the wet concrete below the plate, and after the concrete has set withdrawing the plug to leave a formed hole in the set concrete.

3,886,243

METHOD AND APPARATUS FOR MANUFACTURING TUBULAR FILM FROM THERMOPLASTIC RESIN

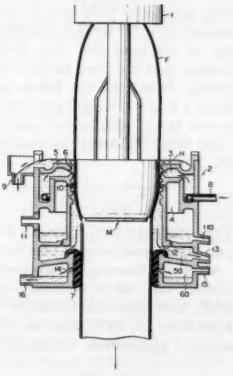
Osamu Uemura; Kiyoshi Fujita, both of Yokohama, and Takeshi Onoda, Hiratsuka, all of Japan, assignors to Showa Kenko K. K., Minato-ku, Tokyo, Japan

Filed Feb. 7, 1973, Ser. No. 330,234

Claims priority, application Japan, Feb. 15, 1972, 47-15251; Feb. 15, 1972, 47-17955

Int. Cl. B29c *17/00*

U.S. Cl. 264—40 **9 Claims**



1. A method of manufacturing tubular film from thermoplastic resin comprising:

A. extruding thermoplastic resin through an annular die producing inflated tubular film;

B. conducting said tubular film generally downwardly from said die and simultaneously cooling it externally and internally;

C. sizing the tubular film by applying vacuum around the external surface thereof in a zone substantially immediately before the film begins to crystallize as a result of said cooling;

D. said external cooling of the film comprising:

a. contacting the external surface of said film above said zone with a first stream of cooling liquid that flows countercurrently to the direction of travel of said film,

b. contacting the external surface of said film below said zone with a second stream of cooling liquid that flows cocurrently with the direction of travel of said film,

c. withdrawing said first stream of liquid from contact with the film at a controlled upper level located above said zone,

d. withdrawing said second stream of liquid from contact with said film downstream of said zone,

E. said internal cooling of the film being conducted by contacting the internal surface of said film with a mandrel therein the upper periphery of which is substantially in the plane of said controlled upper level of withdrawal of first stream of liquid; and

F. taking up the resulting tubular film.

3,886,244

METHOD FOR PRODUCING BRICKS FROM RED MUD

Gerhard Bayer, Ludwigshafen-Rheingonheim; Egon Cherdron, Limburgerhof/Palatinate; Manfred Haerter, Neuhofen/Palatinate, and Ernst Hecht, Waldsee/Palatinate, all of Germany, assignors to Gebr. Giulini GmbH, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 210,508, Dec. 21, 1971. This application Oct. 10, 1972, Ser. No. 296,316

Claims priority, application Germany, Oct. 12, 1971, 2150677

Int. Cl. C04b *33/32*

U.S. Cl. 264—44 **7 Claims**

1. A method for producing bricks from red mud, comprising mixing filter-wet red mud containing between 35 to 50 weight percent water, based on the wet weight of the red mud, with from 5 to 30 weight percent, based on the dry weight of the red mud, of a water-absorbing substance which is at least one substance selected from the group consisting of fly ash, silica gel, alumina gel, cork, peat, sawdust, coal dust, paper waste and textile waste, then mixing the mixture of red mud and water-absorbing substance with clay to provide a resulting mixture containing 50 to 92 weight percent red mud based on the dry weight of red mud plus clay, plus water-absorbing substance, forming said resulting mixture into raw bricks by extrusion pressing, drying the raw bricks to a residual water content of about 1.2 to 4.0 weight percent, based on the wet weight of the raw brick, with heated gases at a temperature below 70℃, and firing the dried raw bricks at a temperature between 900°– 1,100℃.

3,886,245

METHOD FOR PRODUCING BRICKS FROM RED MUD

Gerhard Bayer, Rheinogonheim; Egon Cherdron, Limburgerhof/Pfalz; Manfred Haerter, Neuhofen/Pfalz, and Ernst Hecht, Waldsee/Pfalz, all of Germany, assignors to Gebr. Giulini GmbH, Ludwigshafen, Germany

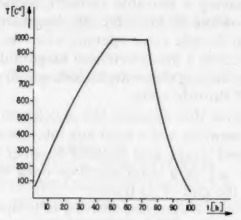
Filed Dec. 21, 1971, Ser. No. 210,508

Claims priority, application Germany, Dec. 22, 1970, 2063028

Int. Cl. C04b *33/04*

U.S. Cl. 264—56 **5 Claims**

1. A method for producing bricks from red mud containing free alkali wherein no softening occurs during firing of the bricks, comprising mixing red mud having a residual water content of 15 to 35 weight-%, based on the weight of dry red mud, with a clay which can chemically bond with and vitrify the free alkali in the red mud to provide a resulting mixture containing 50 to 92 weight-% red mud based on the dry weight of the resulting mixture, forming the resulting mixture at a



water content of 18 to 25 weight-% based on the dry weight of the mixture by extrusion molding into raw bricks, drying the raw bricks with heated gases at a temperature below 70℃, and burning the dried raw bricks at a temperature from 900° to 1,000℃.

3,886,246

METHOD OF PRODUCING A SILICONIZED SILICON CARBIDE ARTEFACT

Peter Kennedy, Preston, and Keith Taylor Scott, Thatcham, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 31, 1972, Ser. No. 302,409

Claims priority, application United Kingdom, Nov. 10, 1071, 52306/71

Int. Cl. C04b *33/32, 35/64*

U.S. Cl. 264—59 **6 Claims**

1. A method of producing a siliconized silicon carbide artefact having a geometric shape formed therein, in which method a green silicon carbide artefact having a geometric shape therein filled with graphite of density at least 0.963 gm/cc is siliconized by contact with silicon and the graphite is then at least in part removed.

3,886,247

METHOD FOR CONVERTING NESTABLE PLASTIC CONTAINERS INTO NON-NESTABLE CONTAINER PRODUCTS

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

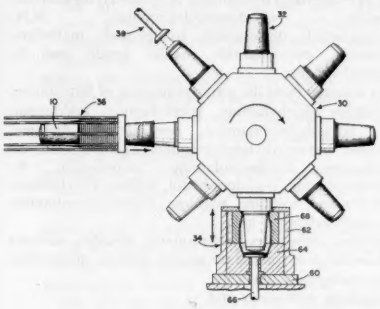
Continuation-in-part of Ser. No. 102,736, Dec. 30, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,301

Int. Cl. B29c *17/04, 17/07*

U.S. Cl. 264—94 **6 Claims**

1. In a process for making a plurality of open-ended nonnestable containers, the steps of forming a plurality of open-ended nestable preform containers of a thermoplastic material and having a stacking means configuration in the side wall of each of said preform containers substantially adjacent the open end of each of said preform containers for preventing jamming of a nested stack of said preform containers, transporting said plurality of said preform containers at ambient temperatures in a nested stack to a remote site, providing a complementary shaped male mold with means for cooperating with the stacking means of one of said preform containers to releasably hold said one of said preform containers when said one of said preform containers is tamped thereon, denesting one of said preform containers from said nested stack and tamping said one of said preform containers on said male mold, heating said one of said preform containers below the stacking means from ambient temperatures to molding temperatures, providing a female blow mold with a non-nestable container configuration, inserting said male mold with said one of said preform containers thereon into said female blow

mold after said one of said preform containers has been heated to said blowing temperatures, and blowing said one of



said preform containers below said stacking means into said non-nestable container.

3,886,248

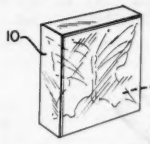
METHOD OF MAKING PLASTIC EMBEDDED SPECIMENS

Donald C. Nicholson, 124-18th St. W. Bldg., Rock Island, Ill. 61201

Division of Ser. No. 850,476, Aug. 15, 1969, Pat. No. 3,596,317. This application June 3, 1971, Ser. No. 149,611

Int. Cl. B29d *3/00*

U.S. Cl. 264—102 **7 Claims**



1. A method of embedding specimens in a thermoplastic resin material which comprises providing a female mold member having a cavity of a size required for producing a plate-like finished product of predetermined size and a male mold member with a punch formation adapted to telescope into the cavity in said female mold member, engaging the mold members sufficiently to close the cavity and preheating the cavity, disengaging the mold members and placing in the cavity a predetermined amount of a granular resin which is adapted to be polymerized from the molten state by application of heat and pressure to form a transparent plate, embedding the desired specimen in said granular resin, engaging the mold members to close the cavity and confine the resin and specimen in the cavity without appreciable pressure on the material, heating the material in the cavity to melt the resin, applying pressure to said molten resin while raising the temperature to polymerize the resin without damage to the specimen, applying vacuum to the cavity to remove excess gases during polymerization, and cooling the material while under pressure so as to harden the resin.

3,886,249

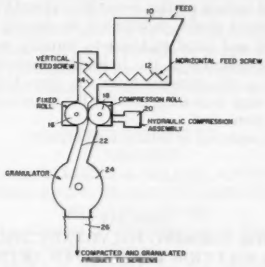
PRODUCTION OF GRANULAR SODIUM DICHLOROISOCYANURATE

James L. Manganaro, New York, N.Y., assignor to FMC Corporation, New York, N.Y.

Filed Mar. 19, 1973, Ser. No. 342,511

Int. Cl. B28b *11/14*

U.S. Cl. 264—118 **1 Claim**



1. In the method of producing granular sodium dichloroisocyanurate from −200 mesh powder in which the powder is fed between two rolls, and one of the rolls is forced against the other with a force of 7,500 ± 50% pounds per linear inch, to produce a continuous sheet of sodium dichloroisocyanurate which is then broken up into granules and sized, the improvement which comprises feeding the powdered sodium dichloroisocyanurate as hydrated material containing 11 to 14% of water of hydration, and free of water not bound as water of hydration whereby the recycle of fines in the process is reduced from a major percentage to a minor percentage.

3,886,250

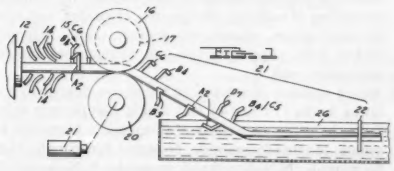
METHOD AND APPARATUS FOR MAKING AN EXTRUDED ARTICLE OF RIGID PLASTIC WITH A GRAINED SURFACE

Edward M. Danko, Detroit, Mich., assignor to Color Custom Compounding, Inc., Detroit, Mich.

Continuation of Ser. No. 119,167, Feb. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 859,010, Sept. 18, 1969, abandoned. This application Dec. 7, 1972, Ser. No. 312,982

Int. Cl. B29d *7/04, 17/14*

U.S. Cl. 264—177 R **5 Claims**



1. The method of making from a rigid plastic material an article having an embossed finish applied to at least a portion of the surface thereof, comprising the steps of:

extruding the rigid plastic material to a preliminary shape through a die having an extruding aperture which is dimensionally larger than the finished sectional size of the article and which forms the portion of the article to which the embossed finish is to be applied as a planar surface;

cooling the surface of the extruded material to a graining temperature at which the material is formable without permanent sticking to another surface;

passing the extruded material between embossing and positioning roller means, the embossing roller means engaging the planar surface portion of the extrusion, and compensating for dimensional instability of the extruded material by driving at least one of said roller means at a speed such as to draw-down the sectional size of the extruded material between the die and the roller means to approximately finished dimensions at the discharge side of the roller means;

then forming the article to a finished shape, in which the embossed surface portion is non-planar and the embossed finish applied thereto is retained, by directly passing the embossed and sized material to forming means which bring the material to the finished shape while heat is retained in the material from the extruding step, said forming step including passing the material through a forming plate; and,

cooling the material to setting temperature.

3,886,251

METHOD FOR FORMING POLYOXADIAZOLE SERIES RESIN SOLUTION INTO SHAPED ARTICLES

Hideo Sekiguchi, and Kazuo Sadamitsu, both of Yokohama, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 313,797, Dec. 11, 1972, which is a continuation-in-part of Ser. No. 717,961, April 1, 1968, abandoned. This application Sept. 4, 1973, Ser. No. 393,978

Claims priority, application Japan, Apr. 11, 1967, 42-22981; Apr. 11, 1967, 42-22984; Apr. 15, 1967, 42-23981; Apr. 15, 1967, 42-23982

Int. Cl.[2] D01D *5/06*

U.S. Cl. 264—184 **17 Claims**

1. A method for forming a shaped article of polyoxadiazole series resin, which comprises introducing a resin solution of 2 to 15% by weight of polyoxadiazole series resin in sulfuric acid of 78 to 110% by weight concentration through an opening of predetermined cross-section into a coagulating bath selected from the group consisting of:

1. 15 to 68% by weight of aqueous solution of sulfuric acid;
2. 60 to 100% by weight aqueous solution of lower aliphatic carboxylic acid having pka (25℃) of less than 3.8 and selected from the group consisting of formic acid, mono- and polyhaloacetic acids and halopropionic acid;
3. mixed aqueous solution of sulfuric acid and at least one of the above carboxylic acids, in which the quantity of sulfuric acid is 15 to 68% by weight or in which the quantity of said carboxylic acids is more than 60% by weight;
4. a solution of any of the above-described coagulating baths (1) to (3) mixed with less than saturated concentration of at least one inorganic salt selected from the group consisting of sulfates, phosphates, chlorides, and nitrates of ammonium, aluminum, sodium, zinc, magnesium, nickel, iron, copper, potassium, manganese, and ferro-aluminum; and
5. mixed solution of any one of the above-described coagulating baths (1) to (4) and amide compounds selected from the group consisting of formamide, N-methyl formamide, N-ethyl formamide, N-propyl formamide, N-butyl formamide, N,N-dimethyl formamide, N,N-diethyl formamide, N,N-dipropyl formamide, N,N-dibutyl formamide, acetamide, N,N-dimethylacetamide, N,N-diethylacetamide, diacetamide, triacetamide, methylenediacetamide, propionamide, oxalic amide, N-methyl pyrrolidone or salts of these amides with mineral acids, to be coagulated, and then washing the coagulated article with water and allowing it to come into contact with an aqueous solution of at least one of the substances selected from the group consisting of:

1. buffer solution indicating pH 5.0 to pH 12.0 selected from the group consisting of Clark-Lubs' buffer solution, Sorensen's buffer solution, Atkins-Pantin's buffer solution, Mengel's buffer solution and Gomori's buffer solution;
2. amide compounds soluble in water selected from the group consisting of formamide, N-methyl formamide, N-ethyl formamide, N-propyl formamide and n-butyl formamide, N,N-dimethyl formamide, N,N-diethyl formamide, N,N-dipropyl formamide, N,N-dibutyl formamide, acetamide, N,N-dimethylacetamide, N,N-diethylacetamide, diacetamide, triacetamide, methylene diacetamide, propionamide, oxalic amide and N-methylpyrrolidone;
3. amines selected from the group consisting of butylamine, propylamine, diethylamine, triethylamine, ethylenediamine, trimethylenediamine, nonamethylenediamine, piperazine, hexamethylenetetramine, ethanolamine, diethanolamine, triethanaolamine, morpholine, N-methylmorpholine, p-aminophenol, aniline, ethylaniline, dimethylaniline, toludine, pyridine, o-phenylenediamine and α-naphthylamine; and
4. hydroxides, carbonates, bicarbonates, silicates, acetates and phosphates of sodium potassium, lithium, magnesium copper, manganese and zinc,

further washing with water and

drying it.

3,886,252

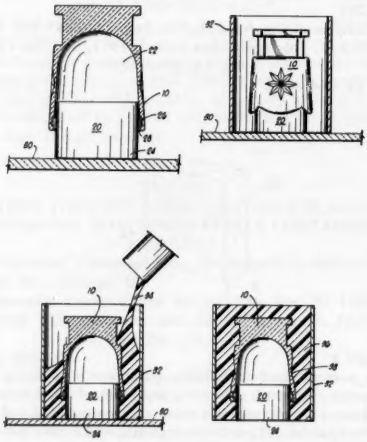
METHOD OF MAKING A WAX CANDLE REPLICA

James E. Eker, and Everett Weidner, both of Woodward, Okla., assignors to Pioneer Arts & Crafts, Inc., Woodward, Okla.

Filed Sept. 7, 1973, Ser. No. 395,378

Int. Cl. B29c *1/02*

U.S. Cl. 264—225 **3 Claims**



1. A method of making a wax candle replica of a hollow art master, comprising the following steps:

making a silicone rubber mold having a cavity and having a bottom portion and a top portion, comprising the following steps:

placing a first plug which is fittingly receivable in the hollow of the art master into the hollow so that the first plug protrudes from the hollow;

placing a mother mold around the art master;

pouring uncured silicone rubber mold-forming materials into the mother mold to cover the art master and a portion of the first plug;

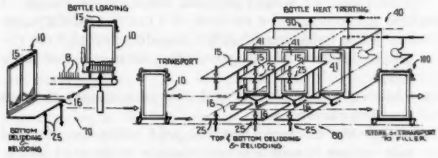
allowing the silicone rubber mold-forming material to cure to form the bottom portion of the silicone rubber mold;
removing the first plug from the art master;
placing a second plug into the hollow, said second plug having a first end fittingly receivable by the hollow of the art master and a second end smaller cross-sectionally than the first end, said first end being submerged in the hollow and the second end protruding therefrom;
sliding the mother mold on the cured silicone rubber mold-forming material so that the mother mold is positioned so as to surround a portion of the second plug while continuing to contain a part of the bottom portion of the silicone rubber mold;
pouring uncured silicone rubber mold-forming material into the mother mold so as to cover a portion of the second end of the second plug;
allowing silicone rubber mold-forming material surrounding the second end of the second plug to cure so as to form the top portion of the mold; and,
removing the mother mold from around the bottom portion and the top portion of the silicone rubber mold;
attaching the top portion of the silicone rubber mold onto the bottom portion of the silicone rubber mold;
pouring a molten wax into the mold to partially fill the silicone rubber mold;
allowing the wax to cool while imparting rotatory motion to the silicone rubber mold to cause the wax to solidify in the form of a wax shell against the surface of the cavity;
removing the wax shell from the silicone rubber mold;
pouring a flame consumable material into the wax shell; and,
providing wick means to communicate with the flame consumable material.

3,886,253

PROCESS FOR HEAT TREATING PLASTIC BOTTLES

Kenneth F. M. Friendship, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,716
Int. Cl. B29c *17/07, 25/00*
U.S. Cl. 264—238 **15 Claims**



1. A process of reducing the creep characteristics of plastic containers comprising the steps of providing a cartridge having upper and lower ends and a plurality of vertically extending transversely interconnected chambers also having upper and lower ends, stacking containers vertically upwardly through the lower ends of the chambers toward the upper ends thereof atop and in contact with each other in an upright position in each chamber, transferring the cartridge into a heat treatment bay, circulating hot air in contact with the plastic containers in a direction upwardly from and through the lower ends through the upper ends in open condition and through and between the chambers for a predetermined period of time and at a predetermined temperature sufficient to reduce the creep characteristics of the plastic containers, and removing the cartridge from the heat treatment bay.

3,886,254

METHOD OF MAKING CERAMIC SINTERED BODY

Hiroshi Tanaka, Yatomi, and Yoshihiro Yamamoto, Komaki, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya City, Japan

Filed Sept. 24, 1973, Ser. No. 400,147
Claims priority, application Japan, Oct. 6, 1972, 47-100999
Int. Cl. C04b *35/70*
U.S. Cl. 264—332 **2 Claims**

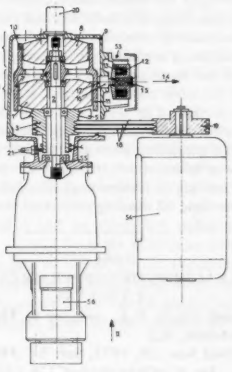
1. A method of making a ceramic sintered body, comprising preparing a powder-mixture consisting essentially of 40 to 80 percent by weight of alumina 16 to 40 percent by weight of titanium carbide and 4 to 20 percent by weight of titanium and hot pressing the mixture at a temperature of from about 1720° to 1850°C and under a pressure of from about 100 to 300 kg/cm².

3,886,255

DEVICE INCLUDING A PULLEY, A CLUTCH, A RETARDER, AND A BRAKE, IN PARTICULAR FOR HOISTING GEARS

Jean Noly, La Clayette, France, assignor to Potain, Chevilly, Larue (Val de Marne), France

Filed Apr. 20, 1973, Ser. No. 353,175
Claims priority, application France, Apr. 21, 1972, 14944/72
Int. Cl. H02k *49/02*
U.S. Cl. 310—94 **1 Claim**



1. An eddy current coupling device, comprising:
a. a rigid, generally cylindrical housing,
b. a central shaft journaled for rotation in the housing,
c. a double bell rigidly secured to the shaft and having a central web and cylindrical, coaxial, first and second bell skirts integral at their one ends with the web and axially aligned with the shaft,
d. a retarder inductor coil rigidly secured to the housing, surrounding the shaft, and substantially completely disposed within the first bell skirt and defining an air gap therebetween,
e. a driven member rotatably mounted to the shaft,
f. a constant speed drive motor having an output shaft,
g. means drivably coupling the output shaft to the driven member,
h. a driver inductor coil rigidly secured to the driven member, rotatably secured to and surrounding the shaft, and substantially completely disposed within the second bell skirt and defining an air gap therebetween,
i. slip ring means surrounding the shaft and rotatable with the driver inductor coil for delivering electrical energy thereto, and

j. an electromechanical safety brake mounted to the housing and including a brake shoe adapted to bear against one of the bell skirts upon actuation.

3,886,256

STATOR CORE FOR ROTARY ELECTRIC MACHINES AND METHOD OF MANUFACTURING THE SAME

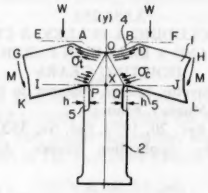
Yasushi Ohuchi, Hitachi; Toshiyuki Ebine, Katsuta; Takefumi Ohwada, and Ryozo Tomozaki, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 275,154, July 26, 1972. This application Nov. 30, 1973, Ser. No. 420,571

Claims priority, application Japan, July 30, 1971, 46-56746

Int. Cl. H02k *1/00*

U.S. Cl. 310—216 **8 Claims**



1. A stator core for rotary electric machines, said stator core being in the form of a helically and closely wound steel strip, the inner side of said wound steel strip having equally spaced slots defining a plurality of equally spaced tooth portions, each of said tooth portions having a recess on the opposite edges of the stem portion thereof, each recess extending from the tail portion of its associated tooth to a location intermediate the stem portion of said associated tooth, each recess having a notch extending from said tail portion of its associated tooth to a location intermediate the associated recess, said notches serving to minimize plastic deformation stresses induced at the time of winding said steel strip.

3,886,257

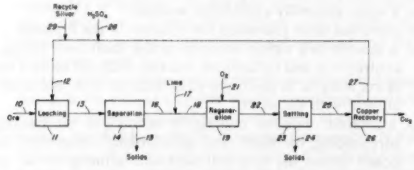
SULFATE LEACHING OF COPPER ORES USING SILVER CATALYST

George J. Snell, Fords, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Nov. 29, 1972, Ser. No. 310,230

Int. Cl. C01g *3/10*; **C22b** *15/08*

U.S. Cl. 423—27 **22 Claims**



1. In a process for the oxidative leaching of copper ores with a leaching solution comprising a member selected from the group consisting of aqueous ferric sulfate, an aqueous mixture of ferric sulfate and sulfuric acid, aqueous sulfuric acid and concentrated sulfuric acid, said oxidative leaching being effected in the presence of molecular oxygen when said member is aqueous sulfuric acid, the improvement comprising:

effecting said leaching in the presence of a catalytic amount of silver, said catalytic amount of silver being at least 25 ppm initially dissolved in said leaching solution.

3,886,258

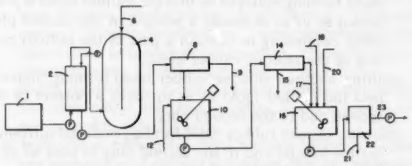
PROCESS OF OBTAINING ZINC OXIDE HAVING IMPROVED FILTERING CHARACTERISTICS AND PRODUCTION OF ZINC SULFATE FROM SAID ZINC OXIDE

John H. Cosgrove, Media, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed July 2, 1971, Ser. No. 159,441

Int. Cl. C01g *9/02*, *9/06*

U.S. Cl. 423—106 **9 Claims**



1. A process for improving the filtration characteristics of solids in a dilute aqueous slurry of hydrated zinc oxide which comprises elevating the temperature of said slurry to at least 257°F. under an elevated pressure sufficient to prevent essentially any loss of the water in the slurry and for a time sufficient to decrease the water of hydration content of the hydrated zinc oxide, said time period being at least 5 minutes, and then treating the slurry to recover filterable solids including zinc oxide therefrom.

3,886,259

PROCESS FOR MINERAL REFINING

William L. Nikolai, Jr., Platteville, Wis., and Thomas D. Wheelock, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed July 17, 1972, Ser. No. 272,353

Int. Cl. C01f *1/00*, *5/00*, *11/00*; **C01b** *25/16*

U.S. Cl. 423—166 **5 Claims**

1. A process employing the recyclic use of sulfur dioxide in the refining of an inorganic calcium material selected from the group consisting of calcium phosphate minerals, calcium carbonate minerals, calcium chloride and calcium nitrate, comprising, in combination, the steps of

providing an aqueous reaction mixture comprising said inorganic material, an aqueous reaction medium, and at least about 0.5 weight percent, based on the weight of said aqueous reaction medium, of a catalyst for the aqueous phase oxidation of sulfur dioxide selected from the group consisting of nitrogen oxides, nitric acid, and ferric nitrate,

introducing sulfur dioxide and oxygen into said aqueous reaction mixture, and

reacting said inorganic material, said sulfur dioxide, and said oxygen in said aqueous reaction medium at an elevated pressure of at least about 30 psig and at a temperature of from about 50°C. to about 70°C. to provide a precipitate of calcium sulfate dihydrate in the form of readily filterable parallelogram-shaped crystals having a length to width ratio of from about 2 to about 3, and to release the anionic moiety of said inorganic material as phosporic acid, carbon dioxide, hydrochloric acid or nitric acid, respectively,

separating said calcium sulfate precipitate from said aqueous reaction medium,

reductively decomposing said calcium sulfate precipitate to provide sulfur dioxide, and

subsequently reacting said sulfur dioxide produced by said reductive decomposition with oxygen and an inorganic calcium compound selected from the group consisting of calcium phosphate minerals, calcium carbonate minerals, calcium chloride and calcium nitrate in an aqueous reaction medium containing at least about 0.5 weight percent,

based on the weight of said reaction medium, of a catalyst selected from the group consisting of nitrogen oxides, nitric acid and ferric nitrate, at an elevated pressure of at least about 30 psig and at a temperature of from about 50°C. to about 70°C. to provide a calcium sulfate dihydrate precipitate in the form of readily filterable parallelogramshaped crystals having a length to width ratio of from about 2 to about 3 and to release the anionic moiety of said inorganic compound.

5. A process in accordance with claim 4 wherein air is employed to supply said oxygen to said reaction.

3,886,260

PROCESS FOR REDUCING NITROGEN OXIDES

Mark Leroy Unland, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 183,227, Sept. 25, 1971, abandoned. This application Dec. 14, 1972, Ser. No. 315,066

Int. Cl. B01d *53/34*

U.S. Cl. 423—213.5 **18 Claims**

1. The process of removing nitrogen oxio from automotive exhaust gases containing a small amount thereof along with carbon monoxide, hydrogen and hydrocarbons, which comprises contacting such gases with a catalyst containing rhodium in catalytically significant amount on a support, in which process an automobile engine is operated richer than necessary to obtain proper exhaust gases stoichiometries for high NO_x conversion, and supplemental air is added to the exhaust prior to contacting the catalyst to obtain proper oxygen content to keep the ammonia production at a very low level but not sufficient to prevent substantially complete reduction of the nitrogen oxides.

3,886,261

ALUMINA AS A COLD-END ADDITIVE

Bruce L. Libutti, Bethayres, Pa., assignor to Betz Laboratories Inc., Trevose, Pa.

Filed Nov. 1, 1973, Ser. No. 412,376

Int. Cl. C01b *17/00*; **B01j** *9/04, 9/08, 9/12, 9/16, 9/20*

U.S. Cl. 423—244 **4 Claims**

1. A method of reducing the amount of sulfur trioxide condensation on, and therefore the amount of sulfuric acid corrosion of, metal parts in contact with flue gases derived from the combustion of sulfur containing fuels which comprises adding to the flue gases at the cold-end of the combustion system where the gases are below 1000°F a particular alumina having a particle size of 260 microns or less, said alumina being added to the gas in an amount from about 0.01 to 0.5 moles of alumina per mole of sulfur trioxide generated.

3,886,262

POTASSIUM ZINC CUPROCYANIDE

Arthur W. McRowe, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 407,863, Oct. 19, 1973. This application Apr. 4, 1974, Ser. No. 457,925

Int. Cl. C01c *3/08*

U.S. Cl. 423—364 **1 Claim**

1. Potassium zinc cuprocyanide of the formula $KZnCu(CN)_4$.

3,886,263

METHOD FOR MANUFACTURE OF HEAT-RESISTANT FIBERS

Akio Shindo; Yoichiro Nakanishi, and Yoshihiro Sawada, all of Osaka, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 2, 1973, Ser. No. 329,172

Claims priority, application Japan, Feb. 3, 1972, 47-12728; Mar. 23, 1972, 47-29602

Int. Cl. C01b *31/07*

U.S. Cl. 423—447 **3 Claims**

1. In a method for the manufacture of heat-resistant fibers by first heating in an atmosphere at 180°C to 350°C and then in a nonoxidizing atmosphere at a temperature up to 3,000°C an organic fiber selected from the group consisting of acrylic fiber, thermally decomposed polyvinyl chloride pitch fiber and dehydrated polyvinyl alcohol fiber, the improvement which comprises effecting said first heating in an atmosphere containing oxygen gas and an acid gas selected from the group consisting of hydrogen chloride, hydrogen bromide, and phosphorus pentachloride, the acid gas content being in the range of 0.5% to 50% by volume and the oxygen gas content being in the range of 25% to 99.5% by volume.

3,886,264

PROCESS FOR HYDROLYZING ALUMINUM ALKOXIDES USING SULFUROUS ACID

Kenneth L. Lindsay, and Paul Kobetz, deceased, late of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 6, 1972, Ser. No. 305,171

Int. Cl. C01b *17/45, 17/46, 17/62, 17/98*

U.S. Cl. 423—512 **19 Claims**

18. A process for hydrolyzing aluminum alkoxide to produce alcohols and basic aluminum sulfite which comprises:

reacting aluminum alkoxide with sulfurous acid in an aqueous system in proportions of at least about 1.5 mol of sulfurous acid per mol of aluminum alkoxide to form alcohol and an aluminum sulfite solution,

separating the alcohol from the aluminum sulfite solution,

removing a portion of the SO_2 from the aluminum sulfite solution to form an insoluble aluminum sulfite, and

reacting SO_2 removed from the aluminum sulfite solution to form sulfurous acid for the reacting step.

3,886,265

MOUTH CLEANSING PREPARATION

Hans Christer Arvid Evers, Sodertalje, and Max Fischler, Enskede, both of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed July 2, 1973, Ser. No. 375,615

Claims priority, application Sweden, June 30, 1972, 8597/72

Int. Cl. A61k *7/16*

U.S. Cl. 424—49 **5 Claims**

1. A composition effective in combatting bad breath consisting essentially of an ene-diol compound selected from the group consisting of ascorbic acid and isoascorbic acid, said compound being present in an amount of at least 10 mg, and an oxidizing agent in the form of a water soluble peroxide selected from the group consisting of alkali metal percarbonates, alkaline earth peroxides and carbamide peroxide, wherein said oxidizing agent is present in an amount corresponding to active oxygen in an amount of at least 1 mg., in each case per peroral dosage unit.

3,886,266

DENTAL TREATMENT

Melvin Goldman, Worcester, and Joseph H. Kronman, Sharon, both of Mass., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 117,822, Feb. 22, 1971, abandoned, and a continuation-in-part of Ser. No. 197,966, Nov. 11, 1971, abandoned. This application Nov. 20, 1972, Ser. No. 307,835

Int. Cl. A61k *7/16*

U.S. Cl. 424—53 **32 Claims**

1. The method of treating teeth for the prevention of calculus comprising contacting the teeth with sufficient of an aqueous composition containing N-monochloroglycine at a pH of about 9 to 11.5 to accomplish said purpose.

3,886,267

IRON PREPARATION SUITABLE FOR PARENTERAL INJECTION AND A PROCESS FOR THE PREPARATION THEREOF

Alf-Göran Dahlberg, Nykvarn; Karl Gustav Högberg, Sodertalje; Sven Lindvall, Sodertalje, and Thore Oskar Verner Rydh, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Oct. 4, 1972, Ser. No. 294,930

Claims priority, application Sweden, Oct. 6, 1971, 12613/71

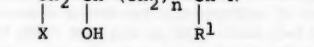
Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—78 **21 Claims**

1. An iron-containing composition suitable for parenteral administration in human and veterinary medicine consisting essentially of an aqueous solution of a complex of iron, said complex containing iron bound to a physiologically innocuous, water swellable polymer which is the reaction product (per mole of component iii below) of

i. about 0.1 to 1.0 moles of at least one hydroxy carboxylic acid selected from the group consisting of arabonic acid, gluconic acid and glucoheptonic acid and salts and lactones derivable therefrom;

ii. about 0.05 to 5 moles of at least one polymerizing agent of the formula



(I)

wherein *n* is an integer selected from the group consisting of 0, 1, 2, 3, and 4, X is selected from the group consisting of Cl, Br, and I; R^1 is selected from the group consisting of OH, Cl, Br, and I; and R^2 is selected from the group consisting of H, and if R^1 is OH also the radical $—CH_2—X$, wherein X has the meaning specified above, and diepoxides derivable therefrom; and

iii. at least one polyhydric alcohol selected from the class consisting of glycerol, polyglycerols, tetritols, pentitols, hexitols, heptitols, partial alkyl ethers of said polyhydric alcohols wherein the alkyl group contains 1 to 5 carbon atoms, and partial hydroxyalkyl ethers of said polyhydric alcohols wherein the alkyl group contains 1 to 5 carbon atoms,

the polymer components having been reacted in aqueous solution at a temperature between about 20°C and the boiling point of the reaction mixture.

3,886,268

IODOPHOR-STEROID COMPOUND PHARMACEUTICAL COMPOSITIONS

Alfred Halpern, Great Neck, N.Y., assignor to Synergistic, New York, N.Y.

Continuation-in-part of Ser. No. 257,505, May 30, 1972, abandoned. This application Mar. 29, 1974, Ser. No. 456,333

Int. Cl. A61k *17/00, 27/12*

U.S. Cl. 424—80 **31 Claims**

1. A germicidal anti-inflammatory pharmaceutical compound selected from the group consisting of polyvinylpyrrolidone-iodine-cortisone, polyvinyl-pyrrolidone-iodine-cortisone acetate, polyvinylpyrrolidone-iodine-hydrocortisone, polyvinylpyrrolidone-iodine-hydrocortisone acetate, polyvinylpyrrolidone-iodine-prednisone, polyvinylpyrrolidone-iodine-prednisone acetate, polyvinyl-pyrrolidone-iodine-prednisolone, polyvinylpyrrolidone-iodine-prednisolone acetate.

3,886,269

PROCESS FOR PREPARING ODOR AND IRRITATION FREE FORMALDEHYDE DISINFECTANT

Ralph E. Trujillo, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 30, 1973, Ser. No. 327,982

Int. Cl. A01n *9/24*

U.S. Cl. 424—82 **4 Claims**

1. A method of synthesizing a disinfectant comprising contacting paraformaldehyde with an organic polar solvent selected from the group consisting of ethylene glycol, propylene glycol, and glycerol, said paraformaldehyde being present in an effective amount below 20% by weight of said paraformaldehyde and solvent, heating said paraformaldehyde in said solvent to obtain a clear solution and to effect formation of a stable disinfectant product absent the characteristic odor and irritation of paraformaldehyde.

3,886,270

INTRAVENOUSLY TOLERATED ANTI-DISTEMPER AND ANTI-HEPATITIS VACCINE, ITS PREPARATION AND ITS USE FOR IMMUNIZATION

Othmar Ackermann, Marbach near Marburg, Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Lahn, Germany

Filed May 24, 1973, Ser. No. 363,413

Claims priority, application Germany, May 26, 1972, 2225548

Int. Cl. C12k *5/00, 7/00*

U.S. Cl. 424—89 **2 Claims**

1. In an adjuvant-free intravenously-tolerated vaccine against distemper and *Hepatitis contagiosa canis*, the improvement wherein said vaccine consists essentially of an attenuated distemper virus and a formaldehyde-inactivated, concentrated, ultra-filtered, cell-free *Hepatitis contagiosa canis* virus having a virus titer of $10^{8.5}$ ID_{50}/ml and a complement fixation antigen titer of at least 1:160 in the concentrate versus 1:40 in the preconcentrate.

3,886,271

ANTIFUNGAL ANTIBIOTIC

Ronald Stark, 336 W. 12th St., New York, N.Y. 10010

Continuation of Ser. No. 764,037, Sept. 24, 1968, abandoned, which is a continuation of Ser. No. 600,389, Dec. 9, 1966, abandoned. This application Dec. 29, 1972, Ser. No. 319,491

Int. Cl. A61k *21/00*

U.S. Cl. 424—115 **2 Claims**

1. A process for the production of an anti-fungal antibiotic which comprises cultivating the steptomycedes organism ATCC 21001 in an acqueous nutrient medium under aerobic conditions, until a sufficient amount of anti-fungal action is imparted to said medium, and recovering the anti-fungal antibiotic therefrom.

3,886,272
SAPONIN-CONTAINING SPERMATOCIDAL COMPOSITIONS

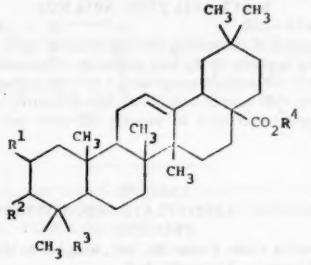
Robert M. Parkhurst, Redwood City, and Sidney J. Stolzenberg, Palo Alto, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Continuation-in-part of Ser. No. 384,101, July 30, 1973, abandoned. This application Apr. 5, 1974, Ser. No. 458,164

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—180 **15 Claims**

1. As a spermatocide adapted to be introduced into the vagina prior to intercourse and thus prevent the occurrence of pregnancy, a composition comprising at least one spermatocidally active saponin material having the structure



wherein R^1 is hydrogen or hydroxyl, R^2 is a saccharide unit made up of from two to five sugar moieties selected from the group consisting of glucose, xylose, arabinose, galactose and rhamnose, R^3 is methyl or hydroxymethyl and R^4 is hydrogen or a glucose sugar moiety.

3,886,273
CERTAIN THIOPHOSPHATE SYNERGISTS

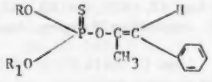
George B. Large, Pinole, and Leland S. Pitt, Sunnyvale, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 328,173, Jan. 31, 1973, Pat. No. 3,830,877. This application Jan. 4, 1974, Ser. No. 430,807

Int. Cl. A01n *9/36*

U.S. Cl. 424—200 **6 Claims**

1. An insecticidal composition comprising an insecticidally effective amount of N-(mercaptomethyl)phthalimide-S-(O,O-dimethylphosphorodithioate) and a synergistic amount of a compound having the generic formula



wherein R and R_1 can be the same or different and are lower alkyl having 1 to 4 carbon atoms.

3,886,274
CONTROL OF ANIMAL PESTS WITH 3H-OXAZOL-[4,5-]PYRIDINE-2-ONE ESTERS OF 3-(-O-)OR (-S-)-O,ODI(LOWER ALKYL) PHOSPHATES AND THIOPHOSPHATES

Haukur Kristinsson, Bottmingen, and Kurt Rufenacht, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

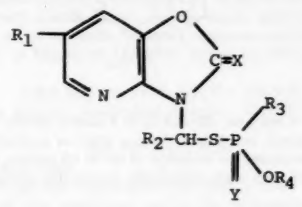
Division of Ser. No. 156,983, June 25, 1971, Pat. No. 3,808,218, which is a continuation-in-part of Ser. No. 155,604, June 22, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 435,065

Claims priority, application Switzerland, June 26, 1970, 9702/70

Int. Cl. A01n *9/36;* **A61d** *7/00*

U.S. Cl. 424—200 **16 Claims**

1. An insecticidal and acaricidal composition comprising (1) an insecticidally and acaricidally effective amount of a compound of the formula



wherein

R_1 is hydrogen, chlorine, bromine or nitro,

R_2 is hydrogen, methyl, chloromethyl or bromomethyl,

R_3 is alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, alkenyloxy of from 2 to 4 carbon atoms, alkoxy-alkoxy having a total of from 2 to 4 carbon atoms, halogenalkoxy of from 1 to 4 carbon atoms, or phenyl,

R_4 is alkyl of from 1 to 4 carbon atoms, alkenyl of from 2 to 4 carbon atoms, alkoxyalkyl having a total of from 2 to 4 carbon atoms, or halogenalkyl of from 1 to 4 carbon atoms, and

each of X and Y represents oxygen or sulphur, and (2) a carrier.

3,886,275
METHOD FOR REDUCING HYPERTENSION BY USE OF DERIVATIVES OF 1,2,4-BENZOTHIADIAZINE-4-CARBOXALDEHYDE-1,1-DIOXIDE

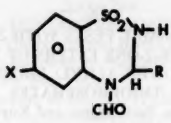
Harry Louis Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 259,111, June 2, 1972, abandoned, which is a division of Ser. No. 11,906, Feb. 16, 1970, Pat. No. 3,691,162. This application Jan. 3, 1974, Ser. No. 430,448

Int. Cl. A61k *27/00*

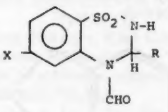
U.S. Cl. 424—246 **7 Claims**

1. A method of reducing hypertension which comprises administering in dosage form to a host in need thereof from about 1 mg/kg to about 50 mg/kg of a compound of the formula



wherein X is halogen, alkyl of up to 5 carbon atoms, trifluoromethyl or nitro, and R is hydrogen, alkyl or cycloalkyl of up to 8 carbon atoms, or arylalkyl of up to 10 carbon atoms.

7. A composition in dosage form for reducing hypertension which comprises a hypotensive amount of a compound of the formula



wherein X is halogen, alkyl of up to 5 carbon atoms, trifluoromethyl or nitro, and R is hydrogen, alkyl or cycloalkyl of up to 8 carbon atoms, or arylalkyl of up to 10 carbon atoms, in combination with a physiologically acceptable carrier.

3,886,276

1,3-DIHYDRO-3-HYDROXY-5-PHENYL-2H-1,4-BENZODIAZEPIN-2-ONE, SUBSTITUTED DIAMINO ACETATE ESTERS AND THEIR ACID SALTS IN COMPOSITIONS AND METHODS FOR INDUCING A CALMING EFFECT

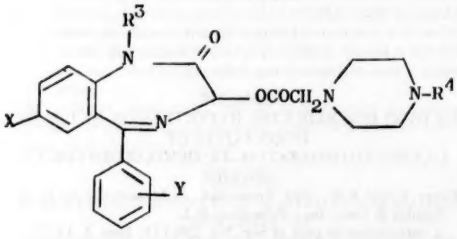
Ronald J. McCaully, Malvern; Abraham Nudelman, Bala Cynwyd, and Stanley C. Bell, Penn Valley, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 223,712, Feb. 4, 1972, which is a continuation-in-part of Ser. No. 129,638, March 30, 1971, abandoned. This application Oct. 29, 1973, Ser. No. 410,741

Int. Cl. A61k *27/00*

U.S. Cl. 424—250 **20 Claims**

1. A process for inducing a calming effect in a warm-blooded animal which comprises administering to said animal an effective amount of a compound of the formula:



in which

R^3 is a member selected from the group consisting of hydrogen, (lower)alkyl, ar(lower)alkyl and (lower)alkoxy(lower)alkyl;

R^4 is a member selected from the group consisting of (lower)alkyl and hydroxy(lower)alkyl;

X is a member selected from the group consisting of halogen, cyano, trifluoromethyl, nitro and (lower)alkylthio;

Y is a member selected from the group consisting of hydrogen, halogen, trifluoromethyl, nitro and (lower)alkylthio; now a pharmaceutically acceptable salt thereof.

3,886,277

METHODS OF CONTROLLING DANDRUFF USING 5,7-DICHLORO-8-HYDROXY QUINOLINE

Rudolf Randebrock, Hamburg-Othmarschen; Volker Bollert, Hamburg; Heinz Lukesch, Hamburg-Sasel; Gertrud Muller, Hamburg; Ludwig Rappen, Diusburg-Meiderich, and Friedhelm Galle, Duisberg-Hamborn, all of Germany, assignors to Hans Schwarzkopf GmbH, Hamburg, Germany

Continuation of Ser. No. 100,447, Dec. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 659,613, Aug. 10, 1967, abandoned. This application May 10, 1973, Ser. No. 359,046

Claims priority, application Germany, Feb. 14, 1967, 40231

Int. Cl. A61k *27/00*; **A01n** *9/22*

U.S. Cl. 424—258 **11 Claims**

1. A method of controlling the formation of visible dandruff comprising applying to the hair and scalp of humans affected therewith a composition comprising a non-toxic pharmaceutically acceptable carrier and 5,7-dichlor-8-hydroxy quinoline in an amount sufficient to provide effective anti-dandruff control.

3,886,278

AMMONIUM CARBOXYLATE SEBUM INHIBITION PROCESS

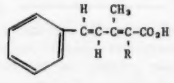
Duane Gordon Gallo, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed Aug. 22, 1973, Ser. No. 390,456The portion of the term of this patent subsequent to Aug. 28, 1990, has been disclaimed.

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—267 **10 Claims**

1. The process for reducing sebaceous cell sebum production in a mammal in need thereof which comprises contacting said sebaceous cell in the skin of said mammal with an amount effective to reduce sebum production thereby of a pharmaceutically acceptable ammonium or amine salt of a 2-trans-4-trans-pentadienoic acid of the formula



wherein R is hydrogen or lower alkyl of from 1 to 3 carbon atoms inclusive, and wherein the cationic nitrogenous portion of said salt is pharmacologically and toxicologically inert for said mammal in said amount effective to reduce sebum production.

3,886,279

ANTI-INFLAMMATORY ANALGESIC METHOD OF TREATMENT AND COMPOSITION

Magda Huhn; Laszlo Tardos; Eva Somfai; Gabor Resofszki; Vera Kovacs nee Mindler, and Maria Palffy nee Oswald, all of Budapest, Hungary, assignors to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Aug. 13, 1973, Ser. No. 387,964

Claims priority, application Hungary, Aug. 24, 1972, CI 1268

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 **1 Claim**

1. A method of treating gastric ulcers comprising orally administering to a patient trichloroethyl-1-(p-chlorobenzoyl)-2-methyl-5-methoxy-3-indolyl-acetate in a daily dosage of

substantially 90 to 150 mg. and sufficient to ameliorate the condition.

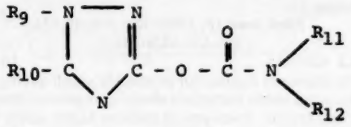
3,886,280

TRIAZOLYL CARBAMATE INSECTICIDES

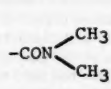
Beat Boehner, Binningen, and Dag Dawes, Pratteln, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 221,052, Jan. 26, 1972, Pat. No. 3,794,661. This application Oct. 10, 1973, Ser. No. 405,238
Claims priority, application Switzerland, Feb. 4, 1971, 1634/71; Jan. 7, 1972, 274/72
Int. Cl. A01n *9/22*
U.S. Cl. 424—269 **10 Claims**

1. An insecticidal composition comprising an insecticidally effective amount of a compound of the formula



wherein R_9 represents C_1–C_6 alkyl, cyclopentyl or cyclohexyl, R_{10} represents hydrogen, C_1–C_4 alkyl or the groups —$COOCH_3$, —$COOC_2H_5$ or



R_{11} represents hydrogen, methyl or ethyl, and R_{12} represents methyl, ethyl, methoxy or phenyl; together with a suitable carrier therefor.

3,886,281

METHOD AND COMPOSITION FOR INHIBITING THE AFTER EFFECTS OF DRUNKENNESS CAUSED BY CONSUMING ALCOHOLIC BEVERAGES

Benjamin Bilbao, Maspeth, N.Y., assignor to Nolte and Nolte, Jericho, N.Y., a part interest

Continuation-in-part of Ser. No. 189,329, Oct. 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 89,064, Nov. 12, 1970, abandoned. This application Sept. 13, 1973, Ser. No. 396,913
Int. Cl. A61u *27/80*
U.S. Cl. 424—278 **18 Claims**

1. An alcoholic beverage containing paraldehyde in a proportion effective to inhibit the after effects of drunkenness caused by consuming the beverage.

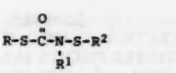
3,886,282

NEMATOCIDAL N-ARYLTHIO S-HYDROCARBYL THIOCARBAMATES

Melancthon S. Brown, deceased, late of Berkeley, Calif., and by Gustave K. Kohn, administrator, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 150,860, June 1, 1971, Pat. No. 3,810,928. This application Feb. 22, 1974, Ser. No. 444,625
Int. Cl. A01n *9/12, 9/20*
U.S. Cl. 424—300 **10 Claims**

1. A method for controlling parasitic nematodes which comprises applying to said nematodes or nematode infested environment a nematocidally effective amount of a compound of the formula



wherein R is alkyl of 1 to 6 carbon atoms, R^1 is alkyl of 1 to 4 carbon atoms and R^2 is phenyl substituted with 0 to 2 chlorine atoms.

3,886,283

FUNGICIDAL CARBOXYLIC ACID NITRILES

Istvan Dory; Laszlo Feuer; Andras Javor, and Gyorgy Matolcsy, all of Budapest, Hungary, assignors to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed May 24, 1972, Ser. No. 256,268
Claims priority, application Hungary, May 31, 1971, CI 1120
Int. Cl.² A01N *9/20*
U.S. Cl. 424—304 **1 Claim**

1. A fungicidal composition containing 0.001 to 10% by weight of the compound α-(3,4-dimethoxyphenyl)-stearic acid nitrile and a carrier therefor.

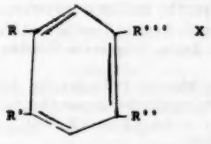
3,886,284

AMINO DERIVATIVES OF TERRASUBSTITUTED BENZENE COMPOUNDS

John J. Merianos, Jersey City, and Phillip Adams, Murray Hill, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 298,759, Oct. 18, 1972, which is a continuation-in-part of Ser. No. 291,824, Sept. 25, 1972, which is a continuation-in-part of Ser. No. 130,783, April 2, 1971, Pat. No. 3,821,407. This application May 15, 1973, Ser. No. 360,448The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.
Int. Cl. A01n *9/00*
U.S. Cl. 424—330 **5 Claims**

1. A method of inhibiting bacteria and fungi which comprises applying to said bacteria and fungi an effective amount of a compound having the structure:



wherein R and R′ are either methyl, or a halogen when R‴ is —CH_2—; or R and R′, taken together, are methylene dioxy; R″ is either methyl or nitro; R‴ is either absent or is —CH_2— or —CH=; and X is the residue of a lower alkyl, mono- or polyamino, or alkanolamino radical.

3,886,285

PHARMACEUTICAL COMPOSITIONS CONTAINING SUBSTITUTED PHENYL SULPHOXIDES AND SULPHONES AND METHOD OF USING SAME

Kenneth Walter Bentley, Willerby, and William Ian Rushworth, Beverley, both of England, assignors to Reckitt & Colman Products Limited, Hull, Yorkshire, England

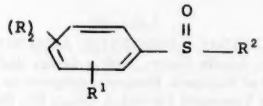
Division of Ser. No. 201,563, Nov. 21, 1971, Pat. No. 3,804,904. This application Nov. 6, 1973, Ser. No. 413,229

Claims priority, application United Kingdom, Dec. 7, 1970, 58065/70; Dec. 7, 1970, 58066/70

Int. Cl. H61k *27/00*

U.S. Cl. 424—337 **10 Claims**

1. A method for treating hypertension which comprises administering to humans an antihypertensive effective amount of a compound of the formula



wherein R is alkoxy of 1 to 3 carbon atoms; R^1 is H, or alkyl or alkoxy of 1 to 3 carbon atoms and R^2 is alkyl of 1 to 7 carbon atoms, alkenyl or alkynyl of 3 to 5 carbon atoms or hydroxyalkyl of 2 to 3 carbon atoms.

3,886,286

NON-CLOGGING GRANULAR CHLORDANE FORMULATIONS

Leo Trademan, Nile, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 200,597, Nov. 19, 1971, abandoned. This application Sept. 26, 1973, Ser. No. 401,099

Int. Cl. A01n *9/30*

U.S. Cl. 424—352 **5 Claims**

1. A free-flowing, non-clogging granular insecticide composition consisting essentially of an admixture of (a) a granular inert carrier having a particle size range of from about 0.3 to about 3.0 mm and having adsorbed thereon from about 20 to about 40 per cent by weight of the total composition of technical chlordane, and (b) from about 0.5 to about 5.0 per cent by weight of the composition of magnesium stearate or aluminum stearate.

3,886,287

COSMETICS CONTAINING SATURATED, BRANCHED SYNTHETIC HIGHER HYDROCARBON

Susumu Kobayashi; Kenichi Tomita, and Hakuji Katsura, all of Yokohama, Japan, assignors to Shiseido Co., Ltd., Tokyo, Japan

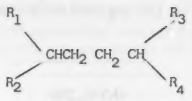
Filed May 24, 1973, Ser. No. 363,372

Claims priority, application Japan, Oct. 6, 1972, 47-100400

Int. Cl.² A61K *7/00*

U.S. Cl. 424—358 **4 Claims**

1. In a method of cosmetically treating human skin comprising application of a non-irritating cosmetic composition comprising conventional cosmetic agents, the improvement which comprises employing as a non-irritating cosmetic base of said cosmetic composition at least one saturated, branched synthetic higher hydrocarbon having 26–48 carbon atoms and having the structural formula:



wherein R_1, R_2, R_3 and R_4 represent an alkyl radical of 2 to 15 carbon atoms respectively, but R_1 differs from R_2 and R_3 differs from R_4.

3,886,288

CHEESE MANUFACTURE USING HIGHLY ACTIVE PROTEOLYTIC ENZYMES

Eldon E. Rice, Palos Park, Ill., and Oreste J. Lantero, Jr., North Fargo, N. Dak., assignors to Swift and Company, Chicago, Ill.

Filed June 15, 1970, Ser. No. 46,536

Int. Cl. A23c *19/02*

U.S. Cl. 426—36 **10 Claims**

1. An improved method for producing a high quality cheese curd having a viable bacterial culture incorporated therein for flavor and texture development utilizing highly active proteolytic enzymes, said method comprising: adding a highly active plant-derived proteolytic enzyme to milk in an amount of about 2 to 40 mgs. per liter of milk, the enzyme being characterized as producing an unstable coagulum when uncontrolled and being one selected from the group consisting of bromelain, papain, ficin and mixtures thereof; totally inactivating said enzyme after a sufficient period of time to alter the protein casein of said milk to paracasein but insufficient to produce excessive hydrolysis of said casein; then adding a bacterial culture after the enzyme has been totally inactivated; and thereafter coagulating the altered casein, said coagulation being characterized by the formation of a stable coagulum with a viable bacterial culture incorporated therein.

3,886,289

FOODSTUFFS CONTAINING 2-(4-HYDROXY-4-METHYLPENTYL) NORBORNADIENE

James Milton Sanders, Eatontown, and Manfred Hugo Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 17, 1974, Ser. No. 461,703

Int. Cl. A23l *1/26*

U.S. Cl. 426—538 **1 Claim**

1. A process for altering the organoleptic properties of foodstuff which comprises adding thereto 2-(4-hydroxy-4-methylpentyl) norbornadiene in a small but effective amount to alter or impart raspberry flavor.

3,886,290

ELECTRODE TYPE COOKING PACKAGE

Ernst Theodore Theimer, Rumson, and Donald Joseph Roslonski, Bricktown, both of N.J., assignors to National Electro-Cook Corporation, East Brunswick, N.J.

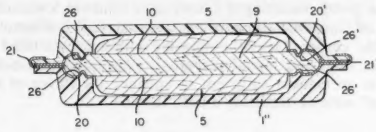
Filed Jan. 4, 1973, Ser. No. 320,877

Int. Cl. B65b *25/22*

U.S. Cl. 426—107 **8 Claims**

1. A single packaged unit of food for cooking the food therein consisting essentially of: (a) A solid electrically low conducting food; (b) A single solid electrically high conducting food unit disposed in fixed substantially surface-to-surface contact with and disposed substantially within said low conducting food; said high conducting food having two axially polar high conducting food portions having external surfaces and extending outwardly beyond said low conducting food; (c) a hollow thermally insulating substantially moisture-impervious container containing said unit of food and being capable of fixedly holding in position and maintaining the

original geometry of said unit of food; said container comprising two sections hinged together and having substantially conterminous edges, a first section and a second section articulating said first section, said first section and said second section having mutually substantially continuous co-extensive edges, at least one of said sections having an internal surface designed to fixedly hold said unit of food over a substantial portion of the surfaces of said food when the container is in a closed position; at least one of said container sections having axially polar ends, said axially polar ends having internal axially polar surfaces which are co-extensive with the external surfaces of said axially polar high conducting food portions; at least two separate electrically conducting foil means extending outwardly from said container, each of said electrically conducting foil means having electrically conducting foil ends



external to said container, said foil ends being designed to make electrical contact with the terminals of an electrical energy source when said container is in a closed position, each of said electrically conducting foil means being affixed to one of said internal axially polar surfaces, said electrical conducting foil means being in fixed intimate electrical contact with each of the axially polar external surfaces of said two axially polar high conducting solid food portions when said container is in a closed position, the ratio of the surface area of foil-contacted high conducting food portion to surface area of non-contacted high conducting food portion being from 1:8 up to 1:4, whereby during the cooking process, the excess heat generated by the passage of electrical current through the solid electrically high conducting food is dissipated into and substantially retained within the electrically low conducting food.

3,886,291

EXPANDED FRIED POTATO SNACK PRODUCT

Miles J. Willard, P.O. Box 2774, Idaho Falls, Idaho 83401

Continuation-in-part of Ser. No. 174,232, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 789,922, Jan. 8, 1969, abandoned. This application Nov. 24, 1972, Ser. No. 309,509

Int. Cl. A23l *1/10*

U.S. Cl. 426—637 **6 Claims**

1. An expanded fried potato-solids containing snack product which when viewed in transverse cross-section, has a total thickness of between about 0.065 and 0.1 inches and defines a substantially continuous porous interior and a denser substantially non-porous exterior integral with said interior, said denser exterior having a general uniform thickness of between about 0.025 and 0.037 inches, and said porous interior constituting about one-third of said total thickness of the expanded product.

3,886,292

PROCESS FOR REDUCING SHORTENING WHILE MAINTAINING QUALITY CAKES

Leo T. Kissell, Wooster, Ohio; Max M. Hanamoto, Lafayette, Calif., and Charles L. Mehltretter, Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 15, 1974, Ser. No. 443,072

Int. Cl. A21d *13/08*

U.S. Cl. 46—553 **8 Claims**

1. Chemically-leavened sweet baked goods containing flour and as the sole shortening, a triglyceride free from any emulsifier, in an amount of 25 to 35% by weight of the flour in said baked good

and which contains about 1 to 4%, based on the weight of shortening, of an additive which is

an ester of a fatty acid containing 12 to 18 carbon atoms with a polyoxyethylene ether of a glycerol glycoside, containing 1 to 2 moles of combined fatty acid per mole thereof, and 5 to 20 moles of combined ethylene oxide per mole thereof.

3,886,293

FOOD PRODUCTS CONTAINING SURFACTANTS

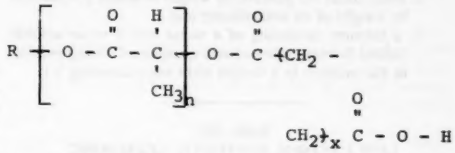
John D. Zech, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 130,465, April 1, 1971, Pat. No. 3,846,479. This application Feb. 8, 1974, Ser. No. 440,939

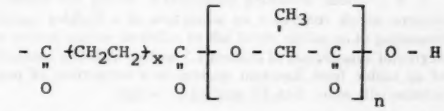
Int. Cl. A21d *13/08*

U.S. Cl. 426—553 **13 Claims**

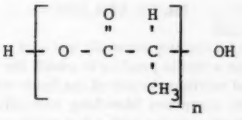
1. A food product containing an effective amount of a surfactant composition selected from the group consisting of 1. an ester characterized by the formula



wherein R is an alkyl or alkenyl group containing from 10 to 22 carbon atoms, *n* is an integer from 1 to 4, and *x* is 1 or 2, 2. an ester characterized by the formula



wherein R is an alkyl or alkenyl group containing from 10 to 20 carbon atoms, *n* is an integer from 1 to 4, and *x* is 1 or 2, 3. an ester composition obtained by subjecting a mixture of succinic acid or anhydride or adipic acid, a lactic acid having the formula



wherein *n* is an integer from 1 to 4, and a fatty alcohol to esterification reaction conditions, and

4. a potassium, calcium, or sodium salt of (1), (2), or (3).

3,886,294

CAROTENOID COLORING COMPOSITIONS AND PREPARATION THEREOF

Alexander S. Emodi, West Orange, and Leonard Joseph Scialpi, Parsippany, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 12, 1973, Ser. No. 340,141

Int. Cl. A23l *1/26*

U.S. Cl. 426—540 **10 Claims**

6. A carotenoid coloring composition in powder form dispersible in water to form optically clear aqueous dispersions, said composition consisting of:

A. from about 5% by weight to about 40 percent by weight of a carotenoid ingredient consisting of
1. a sufficient amount of a carotenoid coloring agent to constitute from about 0.1 percent by weight to about 2.0 percent by weight of the total composition;
2. from about 0.1 percent by weight to about 1.0 percent by weight of an antioxidant; and
3. an emulsifier ingredient consisting of:
a. from about 20 percent by weight to about 80 percent by weight of a polysorbate selected from the group consisting of polysorbate 60 and polysorbate 80;
b. from about 5 percent by weight to about 20 percent by weight of a mixture of monoglycerides of low molecular weight coconut fatty acids;
c. from about 5 percent by weight to about 20 percent by weight of a mixture of saturated fractions of coconut oil triglycerides; and
d. from about 0 to about 60 percent by weight of polyoxyethylene (40) stearate wax; and
B. a water-soluble carrier composition consisting of:
1. from about 0.2 percent by weight to about 2.0 percent by weight of a preservative component;
2. from about 0.2 percent by weight to about 2.0 percent by weight of an antioxidant; and
3. a mixture consisting of a sugar and a water-soluble colloid former, either of said components being present in the mixture in a weight ratio not exceeding 3:1.

3,886,295

LOW CALORIE SYNTHETIC SEASONING

Noel I. Burke, Danville, Ill., and Albin F. Turbak, Convent Station, N.J., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Jan. 4, 1974, Ser. No. 430,966
Int. Cl. A23l *1/22, 1/26*
U.S. Cl. 426—548 **9 Claims**

1. A synthetic seasoning composition having low caloric content which comprises an admixture of a bulking agent consisting of an edible metal salt of cellulose sulfate having a degree of substitution of at least 1.5 and an effective amount of an edible food flavorant present in a proportion of not substantially more than 50 percent by weight.

3,886,296

CANNING PROCESS

Edward M. Brooks, and Chaz W. Houpt, both of Van Nuys, Calif., assignors to Carnation Company, Los Angeles, Calif.

Filed Mar. 22, 1973, Ser. No. 343,930
Int. Cl. A23l *3/00*
U.S. Cl. 426—325 **12 Claims**

1. A process for canning normally low acid or medium acid foods to provide a sterile product in which the taste, texture, appearance and nutritional value of the foods are substantially retained, which comprises blanching normally low acid or medium acid food particles with a hot acidic solution having a temperature and pH sufficient to reduce the overall pH of the food to at least about 5.0, the hot acidic solution being maintained in contact with the food particles for between about 1 to 15 minutes,

contacting said acid blanched food particles with an acidic condiment-containing liquid phase having a pH of below 4.5 in a container so that the acidic condiment-containing liquid phase surrounds the food particles in the container, and reduces the overall pH of said food particles to at least 4.5,

sealing the container,

heat processing the sealed container at a maximum temperature of 212° F. for a maximum period of time of 15 minutes to destroy acid-tolerant microorganisms whereby the contents of the container are rendered sterile without substantial change in the taste, texture, appearance and nutritional value of the food, and

cooling the container.

3,886,297

FLAVOR COMPOSITIONS AND PROCESSES

Thomas H. Parliment, Valley Cottage; William P. Clinton, Monsey, both of N.Y.; Richard Scarpellino, Ramsey, N.J.; Robert J. Soukup, New City, and Martin F. Epstein, Pearl River, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 129,609, March 30, 1971, Pat. No. 3,655,397, which is a continuation-in-part of Ser. Nos. 867,887, Oct. 20, 1969, abandoned, and Ser. No. 857,227, Sept. 11, 1969, abandoned. This application Apr. 11, 1972, Ser. No. 243,055
Int. Cl. A23l *1/26*
U.S. Cl. 426—573 **19 Claims**

1. A process for enhancing the flavor of a non-coffee based foodstuffs comprising adding thereto a compound selected from the group consisting of 2-nonenal, 2-nonenol, lower alkyl acetals of 2-nonenal, esters of organic acids and 2-nonenol in which the carbonyl is not conjugated with a double bond or aromatic ring, and mixtures thereof, said compound being added in an amount sufficient to enhance the flavor of the foodstuff without imparting a fatty flavor.

3,886,298

METHOD FOR PREPARING MEATLIKE FIBERS

John T. Hayes, Jr., North Tarrytown, and Robert Tewey, Dobbs Ferry, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,328
Int. Cl. A23j *3/00*
U.S. Cl. 426—656 **8 Claims**

1. A process for preparing fibers simulating the muscle of animals or flesh of fish comprising:

a. preparing a mixture of proteinaceous material and water, said proteinaceous material containing above 35 percent heat coagulable protein on a dry basis, a major amount of said protein comprising vegetable protein and the moisture content of the mixture being from 20 percent –49 percent

b. blending the mixture to form a dough;

c. compressing the dough in a chamber formed by the channel of an auger rotating within an outer wall heated to at least 250°F wherein the volume of the channel between flights of the auger is decreased 3/2 or more from feed to discharge of the chamber to degas and densify the dough into a unitary body whereby said dough is simultaneously heated and elongated while under compression into a heat set thermally coagulated fibrous condition

d. forcing the heat set fibrous dough through a die wherein the pressure drop to atmosphere is less than 500 psi causing expansion of the heat set dough while maintaining the fibrous condition thereof

e. recovering an expanded, aligned, fibrous product, said product characterized when dry by having a density of greater than 0.65 g/ml and a hydration of 2g.H_2O/g solids or less when soaked one-half hour in water at 50°C.

3,886,299

PROCESS FOR PREPARING MEATLIKE FIBERS

Alonzo Feldbrugge, New York, N.Y.; Cynthia Travers, Laurel, Md.; William F. Cloud, Spring Valley, and Marshall Rankowitz, Bronx, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,301
Int. Cl. A23j *3/00*
U.S. Cl. 426—364 **13 Claims**

1. A process for preparing a substantially unpuffed fibrous product simulating the muscle of animals or flesh of fish comprising:

a. preparing a mixture containing above 35 percent by weight heat coagulable protein;

b. adjusting the moisture content of the mixture to 25 – 65 percent;
c. blending the mixture to form a dough having a fibrous character when stretched;
d. compressing the dough in a chamber formed by the channel of a screw rotating within an outer wall heated to at least 250°F wherein the volume of the channel between flights of the screw is decreased 2/1 or more from feed to discharge of the chamber to degas and densify the dough into a unitary body whereby said dough is simultaneously heated and elongated while under compression to a heat set, thermally coagulated fibrous product, having fiber alignment in the direction of the channel;
e. releasing the compression on the product without forcing the product through a die while maintaining a pressure drop below 100 psi thereby causing 20 percent or less puffing of the product and while maintaining the aligned fibrous condition of the product; and
f. recovering the fibrous product.

3,886,300

METHOD FOR PREPARING BLAND CASEINATES

Joanne G. Fujii, Chicago, Ill., assignor to Beatrice Foods Company, Chicago, Ill.

Filed July 28, 1972, Ser. No. 276,169The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.

Int. Cl. A23j *1/20*

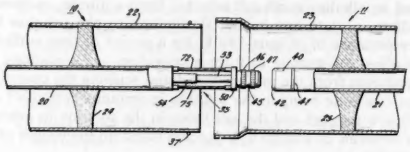
U.S. Cl. 426—656 **22 Claims**

1. A method of producing a bland caseinate comprising preparing a solution of an alkali or alkaline earth caseinate and an alkaline earth salt selected from a nitrate, carbonate, sulfate, acetate and halide, slowly heating the solution to a temperature of at least 140°F. for a period of time sufficient to allow the protein to form a coagulum and separating the coagulum from the mother liquid and washing the coagulum, the caseinate being in the solution in amounts between 1 and 30 w/w percent and the salt being in the solution in amounts of between 20 and 60 w/w percent based on the weight of the caseinate.

3,886,301
PLUG-IN JOINT FOR HIGH CURRENT CONDUCTORS IN GAS-INSULATED TRANSMISSION SYSTEM

John C. Cronin, Greensburg, and James C. Cron, New Stanton, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 12, 1974, Ser. No. 460,537
Int. Cl. H01b 9/04; H02g 15/24; H01r 41/00
U.S. Cl. 174—21 C 11 Claims



1. A sliding connection joint for connecting adjacent sections of a gas-insulated transmission line; each of said sections of said gas-insulated transmission line comprising a central conductor, a grounded outer housing extending coextensively with said central conductor, insulator means supporting said central conductor within its said grounded outer housing, and a dielectric gas under pressure sealed within said grounded housing; said adjacent sections being aligned end to end with their said central conductors connected to one another and with their said outer housings connected to one another; said connection joint comprising a first cylindrical conductive sleeve mechanically and electrically secured directly to one end of a first conductor of one of said adjacent sections and a second cylindrical conductive sleeve electrically connected to an end of a second conductor of one of said adjacent sections which is adjacent said end of said first conductor; said first and second cylindrical conductive sleeves being telescoped relative to one another and being in contact with one another over at least one annular contact area between their adjacent cylindrical surfaces; flexible mechanical support means connected between said end of said second conductor and said second conductive sleeve for normally physically supporting said second conductive sleeve coaxially with said second conductor and for biasing said second sleeve away from the end of said second conductor; and flexible conductor means electrically connected between said second conductive sleeve and said second conductor, whereby, when said outer housings of said adjacent sections are brought toward one another, said second sleeve is physically presented for sliding, telescoping contact relative to said first sleeve, thereby to electrically connect said first and second conductors, while thermally induced relative movement between said first and second conductors is absorbed by movement of said flexible mechanical support means and said flexible conductor means without sliding motion between said first and second conductive sleeves.

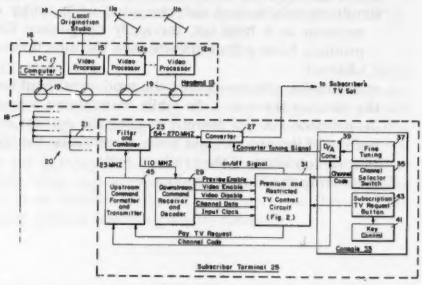
3,886,302
CLOSED CIRCUIT TELEVISION MODEM SHARING SYSTEM

Thomas J. Kosco, Harbor City, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 28, 1974, Ser. No. 437,410
Int. Cl. H04n 1/44
U.S. Cl. 178—5.1 8 Claims

1. A subscriber type television system having a central television program gathering and processing facility, a plurality of subscriber terminals and a cable distribution subsystem linking the facility with the subscriber terminals, the improvement comprising in combination:

at least one MODEM sharing network as an integral portion of the cable subsystem and interposed between said facility and plurality of subscriber terminals for enabling selection of video programs available at the central television program gathering and processing facility servient to the plurality of said terminals, said at least one MODEM sharing network including a data modulator-demodulator for modulation and demodulation of signals communi-



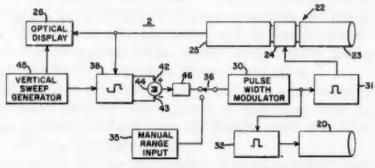
cated in upstream and downstream paths respectively between the subscriber terminals and the facility; and

program control means as an integral portion of said at least one MODEM sharing network for enabling selection of at least one of four modes of operation of said system, said plurality of subscriber terminals each being devoid of capability for enabling selection of said at least one of the four modes of operation of said system and also being devoid of said modulator-demodulator.

3,886,303
AUTOMATIC RANGING IN AN ACTIVE TELEVISION SYSTEM

Edwin E. Morris, Clinton, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed Oct. 21, 1972, Ser. No. 317,203
Int. Cl. H04n 3/12
U.S. Cl. 178—6 6 Claims



1. An automatically ranged active television system comprising, in combination:

a. a pulsed transmitter;

b. a gated television camera providing a video output;

c. an optical display means coupled to the output of said gated television camera and having a raster scan having upper and lower halves;

d. timing circuitry coupled to synchronize the raster scan of said optical display;

e. a switching circuit having an input coupled to the output of said gated television camera, and having first and second outputs, said switching circuitry being coupled to and synchronized by said timing circuitry such that a signal indicative of the video output of said gated television camera during the upper half of the raster scan is provided at said first output and a signal indicative of the

video output of said gated television camera during the lower half of the raster scan is provided at said second output;

f. differential integrating means connected to said first and second outputs of said switching circuit and having an output comprising an error signal indicative of the difference in the video signals provided respectively during the upper and lower halves of the raster scan;

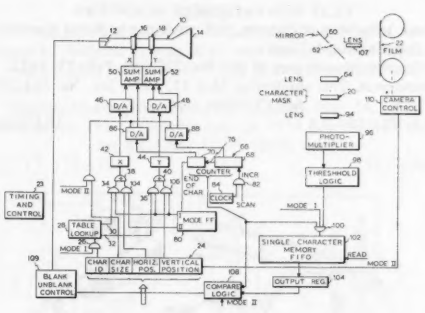
g. a pulse width modulator coupled to the output of said differential integrating means providing an output comprising a range delay signal having a pulse width determined by the error signal;

h. gating means having an input coupled to the output of said pulse width modulator and providing a first gate pulse to said pulse transmitter and a second gate pulse to said gated television camera, said gating means being synchronized by said pulse width modulator such that the second gate pulse is initiated at a time after the initiation of the first gate pulse equal to the width of the range delay signal, whereby the closed loop control of ranging of said active television system is provided.

3,886,304
PHOTOTYPESETTING SYSTEM

Howard Mulder Scott, Moorestown, and William Frederick Schrotz, Cinnaminson, both of N.J., assignors to Information International Inc., Los Angeles, Calif.

Filed June 14, 1973, Ser. No. 369,802
Int. Cl. H04n *5/84*
U.S. Cl. 178—6.7 R **5 Claims**



2. The system of claim 1 wherein said first imaging means includes:

first optical means for imaging said target on said character storage means; and

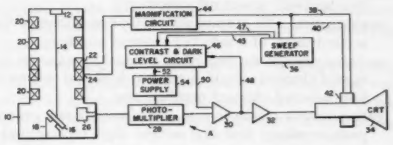
means for producing orthogonal deflection signals for moving said light spot to a position on said target whereby it is imaged by said first optical means on the unit character area storing said identified character.

3,886,305
AUTOMATIC CONTRAST AND DARK LEVEL CONTROL FOR SCANNING ELECTRON MICROSCOPES

Nelson C. Yew, Los Altos, and David H. Colby, Fremont, both of Calif., assignors to Etec Corporation, Hayward, Calif.

Filed Apr. 24, 1972, Ser. No. 247,072
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **8 Claims**

1. In a scanning electron microscope having means for emitting an electron beam, means for focusing said electron beam on a specimen, a cathode ray tube having an electron beam internal thereto, scanning means for scanning said electron beams in a raster-like manner, an electron collector disposed adjacent said specimen and video chain means for amplifying the signal of said electron collector to form a video signal intensity modulating the beam of said cathode ray tube, the improvement comprising: detector means for detecting the zero level of the video signal of a video frame, storage means for storing during the subsequent video frame a signal related to the output of said detector means from the previous

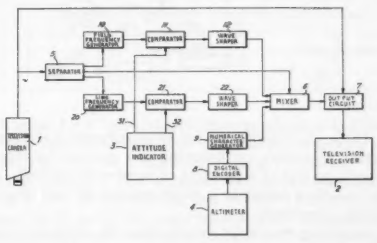


video frame, and control means for controlling the bias of said video chain means in response to the signal in said storage means to control the zero level of the video signal of the subsequent video frame in response to the detected zero level of the video signal of the previous video frame.

3,886,306
SIGHTING APPARATUS FOR HELICOPTERS

Andre Fayard, and Jean-Pierre Couturier, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 17, 1973, Ser. No. 389,312
Claims priority, application France, Aug. 17, 1972, 72.29473; Nov. 17, 1972, 72.40898
Int. Cl. H04n *7/18;* **B64d** *43/00*
U.S. Cl. 178—6.8 **6 Claims**



1. A sighting apparatus for helicopters, comprising: a closed circuit television system including a receiver having a screen, a camera; means for mounting said camera to the lower portion of the helicopter fuselage in such a manner as to furnish on the screen of said receiver an image of a zone located in the vicinity of the helicopter; and further means for the formation, on the image produced on the screen of said receiver, of a first straight line reference mark whose direction remains parallel to one of the axes of said screen and whose position is a function of the pitch angle of the helicopter and of a second straight line reference mark whose direction remains parallel to the other of the axes of said screens and whose position is a function of the roll angle of said helicopter.

3,886,307
ON-OFF SYSTEM FOR TELEVISION RECEIVERS

Wayne Wheeler Evans, Carmel, and Don Edward Christensen, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 11, 1974, Ser. No. 441,487
Int. Cl. H04n *5/44*
U.S. Cl. 178—7.3 R **17 Claims**

10. In a television receiver having channel selection apparatus for selectively conditioning said receiver for reception of signals on one of a plurality of numbered channels, a system for coupling operating power to and removing operating

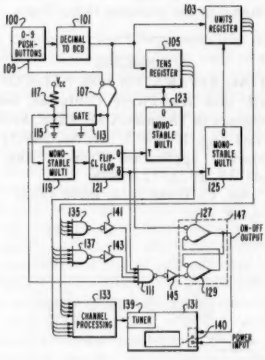
power from a major portion of said television receiver comprising:

bistable means having an input terminal for receiving signals and an output terminal for providing signals in first and second states, said first state corresponding to a receiver power on condition and said second state corresponding to a receiver power off condition;

register means for storing signals representative of first and second digits of a selected channel number;

switching means for providing a signal in response to entry at said channel selection apparatus of said second digit of said selected channel number; and

gating means responsive to the simultaneous presence of predetermined first and second digit representative signals in said register means and said signal from said switching means for setting said bistable means in a second state representative of an off condition.



15. In a television receiver having channel selection apparatus for selectively conditioning said receiver for reception of signals on one of a plurality of numbered channels, a system for coupling power to a major portion of said television receiver comprising:

detecting means for determining the presence of channel number representative signals supplied from said channel selection apparatus;

means coupled to said detecting means for providing a first signal in response to entry at said channel selection apparatus of a first digit of a selected channel number;

bistable means responsive to signals from said last-named means for setting said bistable means in a first state; and power switching means responsive to said first state condition, for coupling power to the major portion of said television receiver.

3,886,308

FACSIMILE RECEIVER

Matthew J. Costello, Bethel; Donald T. Dolan, Ridgefield; Andre T. Debaudringhien, Stamford; Antoon M. Hurkmans, New Milford; Kenneth R. Jasinski, Danbury, and Edward G. Keplinger, Woodbury, all of Conn., assignors to Graphic Sciences, Inc., Danbury, Conn.

Filed Dec. 7, 1972, Ser. No. 312,857

Int. Cl. 346 *139 A;* **H04r** *1/24*

U.S. Cl. 178—7.3 **26 Claims**

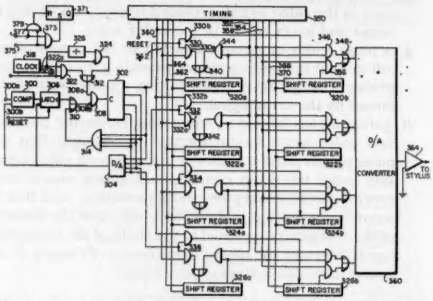
1. a facsimile receiver for reproduction of a document in accordance with analog information obtained from scanning a document line-by-line at a remote transmitter comprising:

A. a writing table having a flat segment for movement of a stylus therealong;

B. means feeding a copy sheet to said writing table;

C. a single stylus mounted to traverse said writing table in straight line motion for reproduction of a document during a portion of its motion;

D. means for converting the analog signal corresponding to each line of scanning to a corresponding digital signal;



E. first and second storage registers for storing first and second successive portions of said digital signal respectively; and

F. means for applying the contents of said register to said stylus in sequence at twice the rate at which said contents were read into said registers when said stylus is in position for writing on said table.

3,886,309

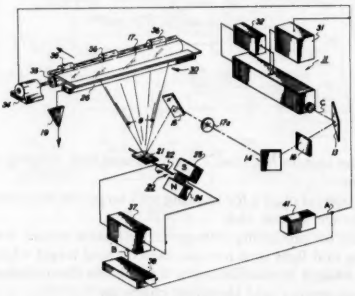
FLAT BED FACSIMILE SCANNERS

Peter John Mason, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 227,939, Feb. 22, 1972, abandoned. This application May 17, 1973, Ser. No. 361,387

Int. Cl. H04n *1/10, 3/02*

U.S. Cl. 178—7.6 **19 Claims**



1. A flat bed scanner for scanning subject copy, said scanner comprising the combination of

means for supplying a substantially collimated beam of light;

an optical path for said light beam;

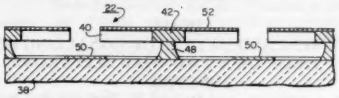
deflection means in said optical path for sweeping the light beam from end-to-end of a scanning station, whereby a scanning spot of light is projected onto said subject copy while said optical path is varied in length; and

lens means in said optical path for shaping said scanning spot and providing said spot with a depth of focus at least as great as the difference between the longest and shortest lengths of said optical paths so that the spot of light projected onto said subject copy has a substantially constant area.

3,886,310
ELECTROSTATICALLY DEFLECTABLE LIGHT VALVE WITH IMPROVED DIFFRACTION PROPERTIES

Jens Guldberg, and Harvey C. Nathanson, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 22, 1973, Ser. No. 390,470
Int. Cl. H04n *3/16;* **H01j** *29/12;* **G02f** *1/28*
U.S. Cl. 178—7.5 D **11 Claims**

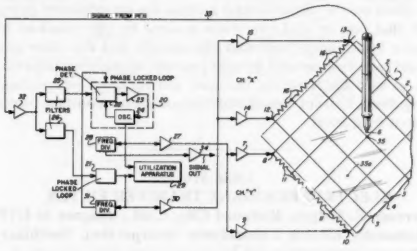


1. An electrostatically deflectable light valve system comprising an array of spaced apart, deformable, light reflective elements supported upon a substrate, each of said reflective elements comprising a central core portion supported by a centrally located post member which extends from one side of the reflective elements to the supporting substrate, a plurality of generally planar, symmetrically spaced apart and shaped independently deformable and reflective wing portions extending outwardly from the central core portion, which wing portions are defined by an equal plurality of thin slits provided between said wing portions which slits extend from the central core portion to the outer edge of the wing portions.

3,886,311
ELECTRICAL WRITING PEN AND SENSOR

James L. Rodgers, Tempe, Ariz., and Joseph L. Tyrrell, Torrence, Calif., assignors to Talos Systems, Inc., Scottsdale, Ariz.

Continuation-in-part of Ser. No. 253,859, May 16, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 463,154
Int. Cl. G08c *21/00;* **H04n** *1/00*
U.S. Cl. 178—18 **10 Claims**

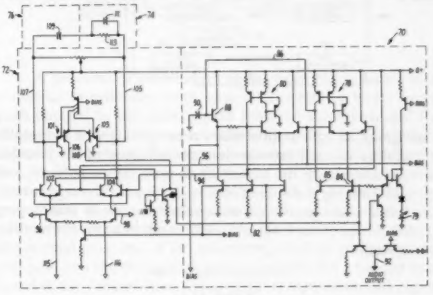


1. An information transmission system including a writing instrument for detecting the information to be transmitted and a writing table with associated electronic circuitry having positions represented by time varying electrostatic field components, said writing instrument comprising, in combination:
a. a pen cartridge containing ink and including a pen point at one end thereof for transferring said ink to a writing surface for effecting a visual record of the path of said pen point;
b. a pen cartridge housing having a longitudinally extending cavity for receiving and supporting said pen cartridge in said housing with said pen point extending from said housing;
c. an electrostatic field pick up element forming a part of said pen point for detecting and re-radiating said electrostatic field components in proximity to the point of contact between said pen point and said writing table;
d. an electrostatic field sensing element secured in said housing adjacent said pen point of said pen cartridge for detecting said electrostatic field components radiated by said pick up element and issuing an output signal in response thereto;
e. signal amplifying means secured to said pen cartridge housing at an end remote from said pen point;
f. electrical conducting means extending uninterrupted substantially the length of said housing and connected to said field sensing element and to said signal amplifying means; and
g. means defining an opening in said cartridge housing extending longitudinally thereof and communicating with said cavity to permit said pen cartridge to be removed and replaced without disconnecting said electrical conducting means.

3,886,312
DECODER FOR FOUR CHANNEL RECORD

Louis Dorren, Millbrae, Calif., assignor to Quadracast Systems, Inc., San Mateo, Calif.

Filed Aug. 16, 1973, Ser. No. 388,822
Int. Cl. H04n *5/00*
U.S. Cl. 179—1 GQ **1 Claim**



1. A decoder for a four channel phonograph record of the type wherein there is derived from each side of the groove of said phonograph record a composite signal containing two components, namely a first or audio frequency component containing A plus B information, and having a frequency in the range of 50 Hz to 15 kHz, and a second or R.F. component comprising a carrier with a frequency of about 30 kHz, having an A minus B audio signal frequency modulated thereon, comprising means for separating said second component from said composite signal, and feeding said second component to phase lock loop means including a voltage controlled oscillator, said voltage controlled oscillator having two feedback paths, namely a first feedback path including a low pass filter having a frequency range of from about 0 to 40 Hz, and a second feedback path including a band pass filter having a band pass of from about 50 to 15 kHz, means for extracting an error voltage from at least said second feedback path, said error voltage representing the audio component of said R.F. component representing the A minus B audio signal, and passing said audio component to matrix means together with said A plus B signal and means to obtain from said matrix means a separate A signal and a separate B signal.

3,886,313
VOICE SECURITY METHOD AND SYSTEM

Kenneth M. Branscome, Dallas; William M. Feath, Irving; George E. Goode, Richardson; Kenneth W. Heizer, and Barrie O. Morgan, both of Dallas, all of Tex., assignors to Datotek, Inc., Dallas, Tex.

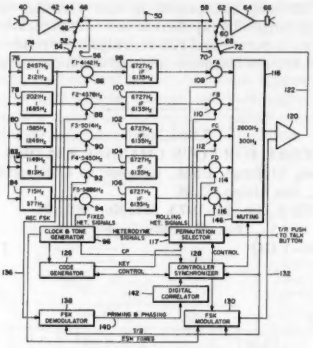
Filed Sept. 29, 1972, Ser. No. 293,412
Int. Cl. H04m *1/70, 3/16*
U.S. Cl. 179—1.5 S **3 Claims**

1. A method of determining optimum subsets of a plurality of possible arrangement permutations of frequency sub-bands

of a voice signal for use in a voice scrambler system comprising:

grouping said possible arrangement permutations into a plurality of possible subsets while excluding preselected forbidden arrangement permutations which provide intelligible voice data;

cross-correlating the arrangement permutations of each possible subset;

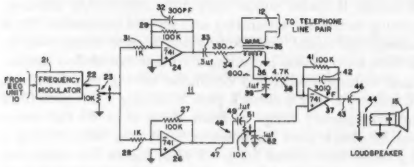


assigning an articulation index representative of the intelligibility to each arrangement permutation of the possible subsets having the lowest cross-correlation indexes; and determining the subset having the lowest average articulation index as the optimum subset for use in rearranging the order of the frequency sub-bands in a voice scrambler system.

3,886,314
NO HANDS VOICE INSTRUCTION FOR EEG TELEMETERING SYSTEM

John R. Pori, Novato, Calif., assignor to Parallel Data Systems, San Francisco, Calif.

Filed Sept. 20, 1973, Ser. No. 399,241
Int. Cl. H04h *11/06*
U.S. Cl. 179—2 DP **3 Claims**

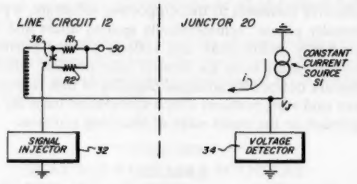


1. A telemetering system for transmitting multi-channel data over a transmission medium which is a single voice quality communications channel and where said multi-channel data frequency modulates a unique carrier frequency for each data channel for providing a frequency modulated signal for transmission over said communications channel said system including receiving means coupled to said voice channel for demodulating said frequency modulated signal and displaying such multi-channel data for interpretation the improvement in said system comprising: transmitter means for coupling said frequency modulated (FM) signal to said voice communications channel and including first amplifier means for coupling said FM signal to said voice channel and having a gain for amplifying such signal to a predetermined level suitable for transmission over said voice channel; operational amplifier means having an inverting input and a noninverting input; means for coupling voice instruction signals transmitted from said receiving means over said voice channel to one of said inputs; second amplifier means for coupling said FM signal to the other input of said operational amplifier means and having substantially the same gain as said first amplifier means for matching said predetermined level; and loudspeaker means coupled to the output of said operational amplifier for receiving said voice instruction signals said inverting and noninverting inputs nulling out said FM signal.

3,886,315
ARRANGEMENT AND METHOD OF SIGNALLING BOTH WAYS THROUGH A TWO WIRE ELECTRONIC JUNCTOR

David Q. Lee, Chicago, and Donald W. McLaughlin, Bolingbrook, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 1, 1973, Ser. No. 402,530
Int. Cl. H04m *7/10;* **H04q** *1/52*
U.S. Cl. 179—18 AH **9 Claims**

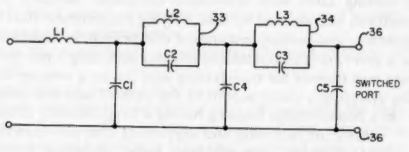


1. A communication system comprising a plurality of telephone stations, each including a line circuit, a plurality of junctors and a matrix, said system being a two wire system and using said junctors as a means of connecting any two line circuits together via said matrix, said line circuits each appearing as an inlet on said matrix and each of said junctors having two ports on the outlet of said matrix, the arrangement being such that one of said two wires is used by said junctors to receive information from said line circuits and the other one of said two wires is used by said junctors to transmit information to said line circuits, the sent and received information being direct current signals superimposed on a constant direct current hold level.

3,886,316
ELECTRIC RESONANT TRANSFER FILTER

Lawrence E. Getgen, Redwood City, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 2, 1973, Ser. No. 337,616
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AA **4 Claims**



1. A lowpass filter suitable for use in a resonant transfer system, having a normally open gate, closed at a sampling frequency (F_s) for the transfer of energy, and comprising:

inductive and capacitive elements connected to approximate a transmission function, $T(j\omega)$, in the resonant transfer mode given by:

$$T(j\omega) = \left[\frac{2}{T_s C}\right]\left[\frac{R(\omega)}{G(j\omega)^2}\right]$$

where

T_s = sampling interval;
C = capacitance seen looking into the switched port of the filter;
$R(\omega)$ = the real part of the impedance looking into the filter from the switched port as a function of frequency ω;
$G(j\omega)$ = the impulse sequence impedance consisting of real part Re $G(j\omega)$ and an imaginary part Im $G(j\omega)$;
ω = the angular frequency for said filter;

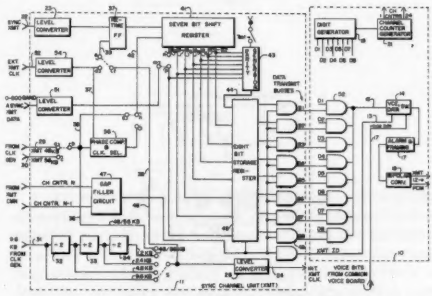
such that,

$T(j\omega) = 1$ for $\omega/2\pi < F_s/2$
$T(j\omega) < 1/2$ for $\omega/2\pi = F_s/2$ and
$T(j\omega) = 0$ for $\omega/2\pi > F_s/2$.

3,886,317
SYNCHRONOUS DATA CHANNEL FOR PULSE CODE MODULATION COMMUNICATIONS SYSTEM

Paul E. Drapkin, Palo Alto, Calif., assignor to Vidar Corporation, Mountain View, Calif.

Filed Dec. 17, 1973, Ser. No. 425,215
Int. Cl. H04j *3/12*
U.S. Cl. 179—15 BY **14 Claims**

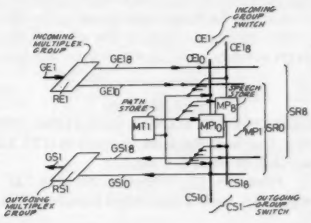


1. A pulse code modulation (PCM) communications system for transmitting information from a plurality of channels such system including a framing bit some of said channels being for transmission of voice type data but at least one channel being exclusively for synchronous digital input data from a single external source of data the repetition rate of transmitted pulses being a predetermined clock frequency said system including a channel counter generator for determining said plurality of channels comprising: clock generator means for receiving said clock frequency and for deriving therefrom a signal for timing said synchronous digital data input said clock generator means being responsive to said framing bit for removing at least one bit from said clock frequency for deriving said timing signal; means for connecting said clock generator means to said external source of data to couple said timing signal to said source of data for providing synchronous operation; storage register means for storing said digital data; and gating means responsive to the channel counter generator counting to said one channel for transferring said stored data to a PCM transmit bus.

3,886,318
PROCESS AND APPARATUS FOR SWITCHING PCM SIGNALS FROM A NORMAL TRANSMISSION PATH TO AN EMERGENCY PATH

Pierre Charransol; Jacques Hauri, both of Paris, and Serge Robert Fontana, Elancourt, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 31, 1973, Ser. No. 365,430
Claims priority, application France, June 15, 1972, 72.21534
Int. Cl. H04j *3/14*
U.S. Cl. 179—15 BF **2 Claims**

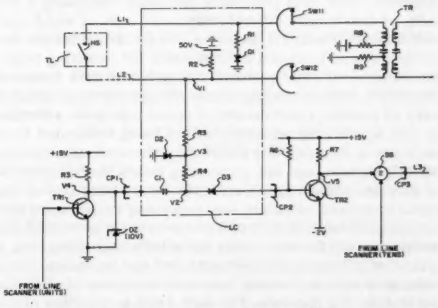


1. A process for switching a signal from transmission over a normal transmission path onto an emergency transmission path parallel to the normal path between the inputs and the outputs of a switching center following receipt of a switching request, comprising the steps of interrupting signal transmission on the emergency path for a time period at least equal to the longest time required for transmission of a signal through a switching center, switching the signal onto the emergency path at the inputs, and connecting the respective outputs of the normal path and of the emergency path to place the normal path and the emergency path in parallel for a time at least equal to the longest time required for transmission of a signal through the center, and operating switching means at the outputs to remove the parallel setting and provide the input signal to the output of the normal transmission path.

3,886,319
EXCHANGE SWITCHING SYSTEM

Stephen S. Walker, Walderslade, England, assignor to GTE International Incorporated, Stamford, Conn.

Filed Sept. 28, 1973, Ser. No. 401,758
Claims priority, application United Kingdom, Oct. 16, 1972, 47662/72
Int. Cl. H04m *3/18*
U.S. Cl. 179—18 FA **4 Claims**



1. A two wire telephone exchange switching system including, for monitoring on ON-HOOK or OFF-HOOK (line-looped) condition of an associated subscriber's telephone instrument, a line circuit of the kind employing a scanner driven pulseplus-bias gate for continuous interrogation of the

line condition and including means responsive to the line-looped condition for applying a priming potential to the bias input of said gate, and further including means associated with the supervisory apparatus of the exchange for applying to said line circuit, via line switches when connected to the line wires, a further potential which also serves as a priming potential for the bias input of said gate, there being provided between said line circuit and the bias input of said gate a potential controlled filter means comprising a noise quenching diode connected from a tapping between a line wire and the bias input of said gate to a point of datum potential, in the ON-HOOK condition said diode being reverse-biased and the arrangement being such that in response to application of said further potential from the exchange said diode is forward biased to provide a low impedance path to the scanner noise currents and to divert scanner noise currents from the line wires.

3,886,320

TELEPHONE EXCHANGE SIGNALING SYSTEM

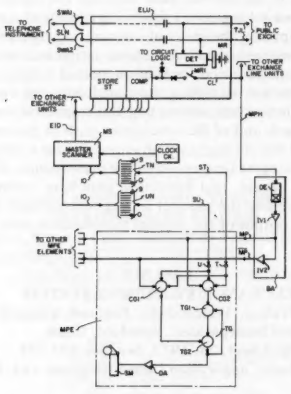
Alan Sutton, Dartford, England, assignor to GTE International Incorporated, Stamford, Conn.

Filed Oct. 15, 1973, Ser. No. 406,724

Claims priority, application United Kingdom, Nov. 10, 1972, 52151/72

Int. Cl. H04q *11/00*

U.S. Cl. 179—18 J **3 Claims**



1. A telephone exchange system including, a plurality of telephone lines; data processing apparatus comprising a plurality of functionally different apparatus units of which each unit includes a store for receiving data presented thereto in a predetermined code and a comparator for detecting coincidence between data stored in said unit and data presented thereto, a data generating means arranged to generate cylically all possible combinations of coded data to be presented to said stores, said generating means being connected to all such stores in order to present the generated data simultaneously thereto, and said generating means further operable to generate address signals cyclically for enabling each of said signal responsive elements; said generating means being connected to all such stores in order to present the generated data simultaneously thereto, means for initially registering data in a store of at least one of said units, and means, included in or associated with each of said units or at least some of said units, for transferring data stored in such a unit to a further one of said units, the said data transferring means comprising means operable when the comparator of said unit detects coincidence between the data being generated at any time and the data stored by the transferring unit, for allotting a store of a further unit to receive the data being generated at this time; the improvement comprising: a signal responsive element, individually associated with each of at least some of the telephone lines served by the exchange, and in which the data processing apparatus of the exchange includes interrogation means individual to each of said apparatus units and responsive to coincidence between receipt by said apparatus unit of a signal to which such a responsive element is to respond and an output signal from the comparator of said apparatus unit, for producing an output signal, all of said signnal responsive elements being connected by way of a common signal highway to the outputs of all of said interrogation means of said apparatus units and means being provided for enabling each of said signal responsive elements in turn, on a time division multiplex basis defined by said data generating means, to respond to an output signal received via said common signal highway.

3,886,321

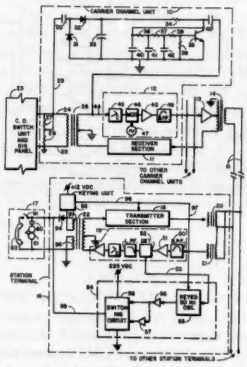
RINGING GENERATOR FOR TELEPHONE STATION TERMINAL

Lester Q. Krasin, and Robert D. McCallum, both of Tulsa, Okla., assignors to Seismograph Service Corporation, Tulsa, Okla.

Filed Nov. 5, 1973, Ser. No. 413,143

Int. Cl. H04m *1/26;* **H04q** *9/00*

U.S. Cl. 179—84 R **5 Claims**



1. A ringing voltage generator for activating a telephone bell for a carrier telephone station terminal comprising:

an oscillator adapted to oscillate in response to a ringing tone signal;

means cooperating with said oscillator for delaying onset of oscillations for a predetermined time interval following the onset of the tone signal;

means responsive to said oscillator for switching a power supply voltage on and off to form a pulsating current for activating the telephone bell; and

means for disabling the oscillator whenever the station terminal telephone is in an off-hook condition.

3,886,322
FULL ELECTRONIC TWO-WIRE TO FOUR-WIRE CONVERSION CIRCUIT

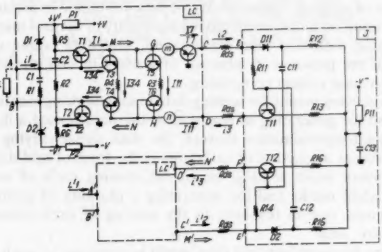
Joël Serge Colardelle, Creteil; Pierre Girard, Paris, and Claude Paul Henri Lerouge, Maurepas, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 20, 1972, Ser. No. 299,385

Claims priority, application France, Oct. 20, 1971, 71.37559

Int. Cl. H04b *1/58*

U.S. Cl. 179—170 NC **6 Claims**



1. An electronic two-wire to four-wire conversion circuit, comprising a switching network, a path through said switching network having a given resistance, a pair of line terminals for receiving a first variable voltage from a subscriber line for transmission of information signals in a first direction away from the subscriber line and for receiving a second variable voltage for transmission of information signals in a second direction toward the subscriber line, a pair of network terminals connecting the switching network to a junctor via two conductors of the switching network respectively assigned to the first and second directions of transmission, the information signals transmitted on said conductors being carried by modulation of a first current in the first direction and by modulation of a second current in the second direction, means including a resistor and a capacitor coupled in series between the line terminals, a pair of intermediate terminals coupled between the line terminals and the network terminals, means including a resistor interconnecting the intermediate terminals, a first complementary differential amplifier coupled between the line terminals and the intermediate terminals, a first current generator coupled between a first one of the intermediate terminals and a first one of the network terminals, means providing a common connection between a second line terminal and a second intermediate terminal, whereby for information signals, current mode operation is set on the network side at the network terminals in the first direction by loading the first current generator with a first resistor and, in the second direction, by supplying a second current from a second current generator connected via a second resistor and the second network terminal to the second intermediate terminal, said second resistor being selected to have a value equivalent to the resistance of the path through the switching network.

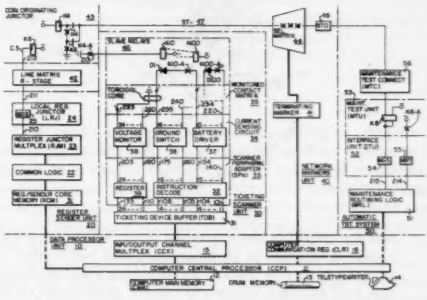
3,886,323
METHOD AND APPARATUS FOR TESTING COMMUNICATIONS SWITCHING SYSTEM SPACE DIVIDED EQUIPMENT SUPERVISORY DEVICES

Howard R. Miller, College Station, Tex., and Leo J. Putchinski, Jr., Wheeling, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 27, 1974, Ser. No. 446,548

Int. Cl. H04m *3/26*

U.S. Cl. 179—175.2 R **6 Claims**



1. In a communication switching system having a switching network for establishing connections between calling and called lines in response to common equipment and having a plurality of space-divided equipment units communicating with the common equipment for performing control operations, the common equipment including scanning means for monitoring the space-divided equipment units, each one of the space-divided equipment units including a supervisory device for generating a supervisory signal and for supplying it to said scanning means, a method of in-circuit testing of space-divided equipment devices, comprising:

providing testing means for controlling one of the space-divided equipment devices under test;

establishing a test connection through the network between said testing means and the device under test;

causing said testing means to control the operation of the device under test and thus to control the generation of its supervisory signal for testing purposes;

causing said scanning means to sense the supervisory signal of the device under test; and

determining whether the device under test is able to operate properly in response to said scanning means.

3,886,324
ADAPTABLE MOUNTING FOR ALTERNATIVE FORMS OF TELEPHONE DIALS

Raymond Charles Hemming, London, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed July 17, 1974, Ser. No. 489,240

Int. Cl. H04m *1/02*

U.S. Cl. 179—178 **4 Claims**

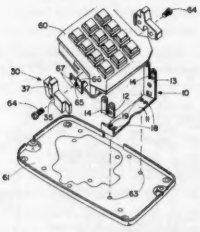
1. An adaptable mounting for alternative forms of dials in telephone sets, comprising:

a bracket for attachment to a base plate and the telephone set, said bracket including a base web and two upstanding spaced apart legs, a slot extending downwardly from a top edge of each leg and a pair of holes adjacent said top edge in each leg, a hole each side of each slot, said holes adapted to receive protrusions on mounting brackets attached to a first form of dial, each slot adapted to receive a screw for attaching said first form of dial, and two pairs of holes in said base web, a first pair in a forward position and a second pair in a rearward position;

means for attaching said bracket to said base plate by one of said two pairs of holes;

a spacer for positioning between said base plate and said base web and having a pair of holes for alignment with said second pair of holes in said base web for mounting said first form of dial;

adaptors for positioning on said bracket, an adaptor on each leg; each adaptor including a rib slideable in said slot in

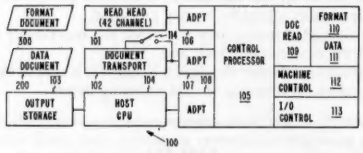


said leg, a further slot extending through the adaptor and a pair of recesses in an inner face, said slot further slot adapted to receive a screw for attaching a second form of dial, said recesses adapted to receive protrusions on said mounting bracket of said second form of dial.

3,886,325
FORMATTING FOR RECORD-CONTROLLED MACHINES

Richard L. Dorr; Georg N. Gaebelein; Donald J. Kostuch, and Malcolm E. Varner, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 18, 1973, Ser. No. 352,393
Int. Cl. G06k *7/00;* **G06f** *9/04*
U.S. Cl. 235—61.6 R **54 Claims**



1. A system for reading data indicia on data documents according to an arbitrary format prescribed by a separate format document having preprinted format fields adapted to be marked with format indicia for specifying particular attributes of said data documents, said system comprising:

meanas for collecting indicia on said separate format and data documents, and for producing signals therefrom;

means for differentiating between said preprinted format document and said data documents, and for constructing a format configuration from those of said signals representing said format indicia in accordance with the locations of said format indicia within respective ones of said preprinted format fields;

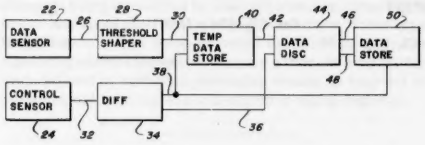
means for constructing data records for each of said data documents in response both to said format configuration and to those of said signals representing said data indicia; and

means for transmitting said data records to an output device.

3,886,326
DATA-SENSING VERIFICATION SYSTEM AND METHOD

Edward E. Horvath, and Robert M. Janoski, both of Madison, Wis., assignors to T & T Technology, Inc., McFarland, Wis.

Filed June 8, 1973, Ser. No. 368,332
Int. Cl. G06k *5/00, 7/14*
U.S. Cl. 235—61.6 E **28 Claims**



1. A data-sensing verification system for indicating the validity of a signal representative of data contained in a marking location on a document having a plurality of control marks associated with said marking location, said data taking the form of the presence or absence of a mark in said marking location, said system comprising:

data-sensing means for sensing data in said marking location and for generating in response to the data sensed a data signal representative thereof, the data signal varying in value as a function of variations in the form of said data;

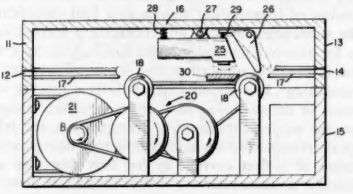
control mark sensing means for sensing each of said control marks and for generating a plurality of control signals, one in response to the sensing of each control mark; and

means for sampling said data signal in response to each of said control signals and for generating an indicating output indicative of the validity of said data signal as a function of the existance of a selected relationship between said samples.

3,886,327
CREDIT CARD

Laszlo J. Dobosi, 4317 Markwood La., Fairfax, Va. 22030

Filed Mar. 5, 1974, Ser. No. 448,416
Int. Cl. G06k *7/08;* **G11b** *5/54, 21/22;* **G06k** *19/00*
U.S. Cl. 235—61.7 B **1 Claim**



1. A credit card utilization system comprising a plurality of credit cards, each credit card bearing an elongate strip of sound recording material, said strip being disposed lengthwise of the credit card and including a recorded code word known only to the owner of the card, and a plurality of card reading devices for reproducing the code word recorded on said strip, said card reading devices each comprising a housing, an inlet slot in a first wall of the housing for receiving a credit card to be read, an outlet slot in a second wall of the housing for discharging a credit card from said card reading device, rotatable wheels within said housing and positioned such that a card introduced into said device is supported on the periphery thereof such that, on rotation of said wheels, said card is transported in a straight path through said housing from said inlet slot to said outlet slot, means for rotating said wheels, sound reproducing means located adjacent said straight path for reproducing the code word recorded on said strip and comprising a sound reproducing head moveably mounted

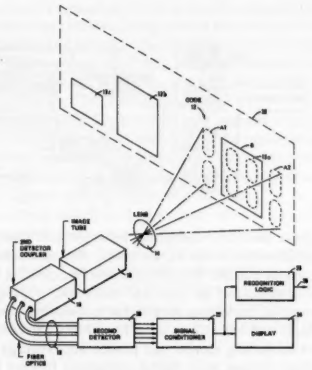
within said housing and moveable between a first position in which the head is spaced from a card in said straight path and a second position in which the head is in sound reproducing association with said strip on a card in said straight path for reproducing said recorded code word, a trigger member actuated by motion of said card in said straight path for moving said sound reproducing head from said first position to said second position for reproducing the code word recorded on said strip, means for biasing said head into said first position, and listening means to permit an operator of the device to listen to the reproduced code word for comparison with a code word given orally by the card owner.

3,886,328

ELECTRO-OPTICAL READER

A. D. Harms, Jr., Winona; Robert B. Hemphill, Dallas; Chris A. Balthrop, Bedford, and Harley D. Peter, Dallas, all of Tex., assignors to E-Systems Inc., Dallas, Tex.

Filed June 1, 1973, Ser. No. 366,190
Int. Cl. G06k *7/10;* **G08c** *9/06;* **G11c** *11/42*
U.S. Cl. 235—61.11 E **27 Claims**



1. A recognition system for reading encoded data carried by an object and moving with respect to a reading station along a travel path, comprising in combination:

first means for receiving energy reflected from the encoded data to provide a first background image area from a first zone at the reading station, a code image area from a second zone at the reading station juxtapositioned the first zone, and a second background image area from a third zone at the reading station juxtapositioned the second zone;

second means for electronically deflecting energy reflected from the encoded data of the three zones at the reading station to said first means;

third means coupled to said first means and responsive to the three image areas to generate a first electrical signal related to said code image area, and a second electrical signal related to said first and second background image areas; and

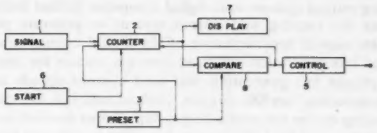
circuit means connected to receive said first and second electrical signals for combining said first and second electrical signals into a series of code related pulses representing the object carried encoded data.

3,886,329

PRESET COUNTER APPARATUS

Hiromitsu Kamiyama, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1974, Ser. No. 433,815
Claims priority, application Japan, Jan. 18, 1973, 48-7389
Int. Cl. H03k *21/36;* **G03b** *27/06*
U.S. Cl. 235—92 SB **6 Claims**



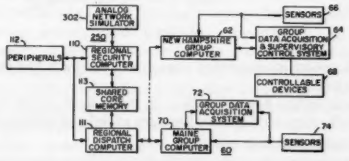
1. A preset counter apparatus comprising a comparator circuit for producing a first control signal when a value to be compared is smaller than a reference value and producing a second control signal when said value to be compared is equal to or greater than said reference signal, a control means actuated by said second control signal from said comparator circuit to control operation of a utilization machine, a preset means to preset a preselected number of said machine operations and supply said preset information to said comparator circuit as said reference value, means operatively interlocked with said machine operations to generate signals represetative of said operations, a counter circuit to count said operation representing signals and apply the count information thereof to said comparator circuit as said value to be compared with said reference value, and a start signal means to supply a machine operation start signal to said counter circuit, wherein said counter circuit is so arranged as to usually hold therein said preset information from said preset means and, upon application of a signal from said start signal means, to clear said preset information and begin to count the number of signal from said operation representing signal means starting from zero state, said counter circuit, upon beginning said count, being maintained in the state in which said preset information is cleared by means of said first control signal from said comparator circuit and, upon receiving said second control signal from said comparator circuit, being restored to said usual state, and at the same time resetting said start signal means to the original state before the operation was initiated.

3,886,330

SECURITY MONITORING SYSTEM AND METHOD FOR AN ELECTRIC POWER SYSTEM EMPLOYING A FAST ON-LINE LOADFLOW COMPUTER ARRANGEMENT

David M. Egelston, Pittsburgh, Pa., and Jerry C. Russell, Minneapolis, Minn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1971, Ser. No. 175,292
Int. Cl. G06g *7/62;* **H05k** *1/00*
U.S. Cl. 235—151.21 **14 Claims**



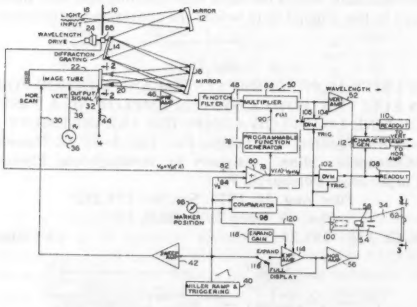
1. A security monitoring system for an electric power system comprising a security loadflow computer including an analog network simulator and a programmed digital computer, means for generating signals representing predetermined on-line system data including at least some unit genera-

tor and tieline power values and at least some bus voltage values, means for applying said data signals to said digital computer, said digitial computer including means for storing said predetermined on-line data, said analog simulator including a plurality of bus DC circuits and line DC circuits interconnected to correspond to the AC network, said digital computer including means for generating representations of bus generation and load currents as a function of predetermined parameters including stored bus power and voltage data, an analog output system, said digital computer further including means for causing said output system to generate phasor current signals representative of the digital computer determined bus generation and load currents, means for applying the phasor bus generation and load current signals to the corresponding bus DC circuits, each of said bus DC circuits including means for responding to line phasor current and bus generation and load phasor input current signals and for generating an output bus voltage phasor signal, each of said line DC circuits including means for responding to the difference between applied bus voltage phasor signals and generating an output line phasor current signal in accordance at least with a representation of the equivalent series branch line impedance, said digital computer further including means for generating representations of bus voltage phasor signals after the generation and load phasor current signals are applied to said DC bus circuits, means for generating representations of bus generation and load current values in successive iterations after a startup iteration as a function of bus voltage values determined in the next preceding iteration, means for converging the iterative process to a solution and for sensing when a solution is reached and means for monitoring representations of predetermined solution parameters and generating alarms under predetermined conditions.

3,886,331
ELECTRONIC SCANNING SPECTROPHOTOMETER SYSTEM

Joseph Philip Schierer, Jr., Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 230,763, March 1, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 397,381
Int. Cl. G01j *3/02*
U.S. Cl. 235—151.3 **21 Claims**



1. A spectrophotometer apparatus in which the improvement comprises:

optical means for separating an input light signal into spacially displaced spectral images of light of different wavelengths and intensities;

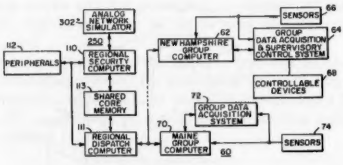
photoelectric detector means for receiving and measuring said spectral images;

scanning means for scanning said spectral images to cause said detector means to produce an electrical analog output signal including spectral intervals having time and amplitude characteristics corresponding to the wavelength and intensity of said spectral images, said scanning means also producing an electrical analog control signal during said scanning: and electronic normalizer means connected to the output of said detector means, including function generator means for changing by different predetermined amounts the amplitudes of the spectral intervals of said analog output signal in response to a predetermined electrical output signal produced by said function generator means when the analog control signal is applied to the input of said function generator means by said scanning means, to compensate for nonuniform spectral response characteristics of said apparatus and to produce a normalized analog output signal whose spectral intervals have amplitudes proportional to the intensities of the corresponding spectral images of the input light signal.

3,886,332
APPLICATION OF BASECASE RESULTS TO INITIATE ITERATIONS AND TEST FOR CONVERGENCE IN A HYBRIDE COMPUTER ARRANGEMENT USED TO GENERATE RAPID ELECTRIC POWER SYSTEM LOADFLOW SOLUTIONS

Jorge E. Petit, Bethel Park, Pa.; Mark K. Enns, Ann Arbor, Mich., and Norman R. Carlson, Export, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1971, Ser. No. 175,291
Int. Cl. G06g *7/62;* **H05k** *1/00*
U.S. Cl. 235—151.21 **16 Claims**

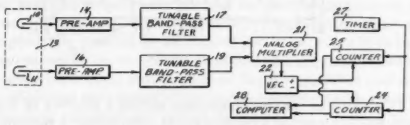


1. A hybrid loadflow computer arrangement comprising a DC analog simulator of an AC network, said simulator including a plurality of bus DC circuits and line DC circuits interconnected to correspond to the AC network, a programmed digital computer including means for generating bus generation and load current values as a function of predetermined parameters including stored bus power and voltage data, an analog output system, said digital computer further including means for causing said output system to generate phasor current signals representative of the digital computer determined bus generation and load current values, means for applying the phasor bus generation and load current signals to the corresponding bus DC circuits, each of said bus DC circuits including means for responding to line phasor current and bus generation and load phasor input current signals and for generating an output bus voltage phasor signal, each of said line DC circuits including means for responding to the difference between applied bus voltage phasor signals and generating an output line phasor current signal in accordance at least with a representation of the equivalent series branch line impedance, said digital computer further including means for generating representations of bus voltage phasor signals after the generation and load phasor current signals are applied to said DC bus circuits, means for generating bus generation and load current values in successive iterations after a startup iteration as a function of bus voltage values determined in the next preceding iteration, means for converging the iterative process to a solution, means for generating specified voltages for the network busses including acquired on-line voltage values for at least some of the busses, means for comparing at least some of the respective computed bus voltage signal representations with the respective specified bus voltages, and means for terminating the iterations and producing a loadflow solution when the bus voltage differences conform to a predetermined standard.

3,886,333
METHOD OF EVALUATING THE PRECISION OF CROSS-SPECTRAL DENSITY MEASUREMENTS OF RANDOM NOISE

Charles E. Cohn, Clarendon Hills, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation-in-part of Ser. No. 265,060, June 21, 1972, abandoned. This application Dec. 21, 1973, Ser. No. 427,393
Int. Cl. G21c *17/00;* **G06g** *7/19*
U.S. Cl. 235—181 **1 Claim**



1. The method of measuring the coherence of first and second noise signals including the steps of:

a. filtering each of said first and second noise signals in first and second band-pass filters respectively, the band of frequencies passed by each of said band-pass filters being the same and further being within the band of frequencies of interest and having a bandwidth narrow enough to give sufficient resolution so that variations in the cross power spectral density function are not smeared and wide enough to give adequate precision;

b. multiplying said filtered first and second noise signals in an analog multiplier to develop a first product signal with said first and second noise signals having the same polarity and a second product signal with said first and second noise signals having opposite polarities;

c. converting said first and second product signals to first and second pulse trains respectively;

d. integrating said first pulse train over a predetermined time period T to develop the parameter A;

e. integrating said second pulse train over said time period T to develop the parameter B; and

f. calculating the coherence γ according to the formula

$$\frac{A}{B} = \frac{2/\pi\,(\gamma \sin^{-1}\gamma + 1-\gamma^2+\gamma)}{2/\pi\,(\gamma \sin^{-1}\gamma + 1-\gamma^2-\gamma).}$$

3,886,334
METHOD AND APPARATUS FOR SIMULATING A CLASS OF AIRCRAFT

Thomas R. Cummings, and William J. Hewitt, both of Binghamton, N.Y., assignors to The Singer Company, New York, N.Y.

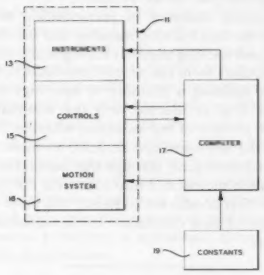
Continuation of Ser. No. 67,358, Aug. 27, 1970, abandoned. This application June 7, 1973, Ser. No. 367,804
Int. Cl. G06g *7/72*
U.S. Cl. 235—184 **12 Claims**

1. Apparatus for simulating in real time any selected vehicle of a predetermined class of vehicles having common operational and physical characteristics, comprising:

a trainee station having simulated controls and instruments for providing outputs representative of a trainee's operation of the simulated controls and for receiving inputs representative of instrument readings;

computing means for receiving and processing said outputs according to motion and engine equations for said class of vehicles, said equations being expressed in terms of vehicle parameters for one vehicle of said class and conversion constants which compensate for differences in performance between said one vehicle and the other vehicles of said class; and

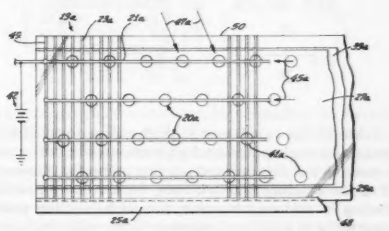
means for providing to said computing means electrical signals representative of values of the conversion constants for any selected vehicle of said class, said computing means employing said electrical signals to process said outputs and produce said inputs, whereby said selected vehicle is simulated.



3,886,335
COLLATED CABLE MATRIX SWITCH

John E. Hendricks, Encino, Calif., assignor to Industrial Electronics Engineers, Inc., Van Nuys, Calif.

Filed Jan. 26, 1973, Ser. No. 327,152
Int. Cl. H01h *13/70;* **G08c** *9/00*
U.S. Cl. 200—1 R **27 Claims**



1. A switch assembly having a plurality of switches for switching an input signal and being adapted for use with a keyboard having a plurality of keys each associated with one of the switches, the keys being aligned in a plurality of rows each extending in a first direction and a plurality of columns each extending in a second direction transverse to the first direction, the assembly comprising:

a first backing member having a substantially planar inner surface and electrical insulating properties;

a plurality of first conductors disposed on the inner surface of the first backing member and each having the input signal thereon, the first conductors extending in the first direction and spaced in electrically insulated relationship to one another;

a second backing member having a substantially planar inner surface and electrical insulating properties;

a plurality of second conductors disposed on the inner surface of the second backing member and extending in a third direction different from the first direction and the second direction and spaced in electrically insulated relationship to one another, at least one particular conductor included among the second conductors on the second backing member and extending in close proximity

to an associated pair of the first conductors on the first backing member at a particular pair of the switches;

portions of at least the second backing member defining an aperture which extends across and interrupts each of the particular conductors to break the electrical continuity of the associated particular conductor between the associated particular pair of the switches;

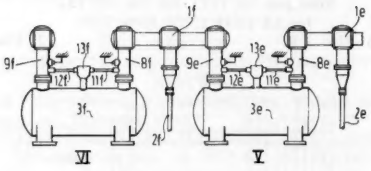
insulation means disposed in juxtaposition to the inner surface of the first backing member and the inner surface of the second backing member for normally insulating the first conductors from the second conductors, the insulating means defining a plurality of openings between the associated first conductor and the associated second conductor at each of the switches; whereby

the keys of the keyboard are actuable to move the associated second conductor through the associated opening in the insulation means and into electrical contact with the associated first conductor to switch the input signal from the associated first conductor to the associated second conductor.

3,886,336
METAL CLAD SWITCH GEAR FOR HIGH VOLTAGES

Rintje Boersma, Harmelen, and Gijsbert Waldemar Irik, Bilthoven, both of Netherlands, assignors to COQ B.V., Utrecht, Netherlands

Filed Apr. 11, 1974, Ser. No. 459,939
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 R **4 Claims**

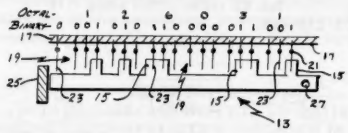


1. Metal clad switch gear for high voltages provided in each phase with single-pole switching sections which are connected in series in a closed ring and junction points for the connection of cables or other network-lines, each switching section extending in said ring between two such junction points and comprising at least two isolator switches with single interruption, a circuit-breaker connected between said isolator switches, two earthing switches cooperating with said isolator switches, connecting conductors interconnecting said isolator switches and said circuit-breaker, driving mechanisms and metal casings surrounding said switches, circuit-breaker and connecting conductors, each isolator switch and each earthing switch including at least one fixed contact and one movable switching contact cooperating therewith, one of the two cooperating contacts of each isolator switch being permanently electrically conductively connected with a junction point and the other one being permanently electrically conductively connected both with a connecting conductor leading to the circuit-breaker and with one of the two cooperating contacts of the earthing switch cooperating with the isolator switch in question, the other contact of said earthing switch being attached to the metal casing surrounding said earthing switch, and the driving mechanisms of the two isolator switches and the two earthing switches of each switching section being so coupled with one another that during each switching operation in a section the two isolator switches thereof are simultaneously brought from their open into their closed and from their closed into their open condition, respectively, and the two earthing switches of said section are simultaneously brought from their closed into their open and from their open into their closed condition, respectively.

3,886,337
TEMPLATES FOR SWITCH SETTING IN COMPUTER CONTROL

Kurt H. Haase, Watertown, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 7, 1973, Ser. No. 413,730
Int. Cl. H01h *43/08*
U.S. Cl. 200—46 **1 Claim**

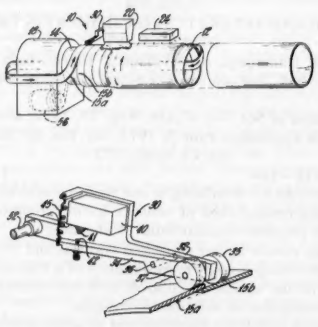


1. Apparatus for simultaneously setting a number of toggle switches in a row on a control panel comprising, a plurality of elongated rectangular templates, a series of teeth on the inward edge of each of said templates and extending inwardly therefrom, said series of teeth contacting the handles of a predetermined group of switches on the control panel, and a guide bar fixedly positioned to slidably contact one end of said template to prevent lateral movement during the setting operation, in combination with a wire ring passing through aligned openings in each of the templates for holding and indexing said plurality of templates in the proper sequential order, and a separation washer positioned on said ring between the first and last of said plurality of templates such that each of the templates can be used individually in the proper sequence without removal from said ring, whereby each template which is positioned in the proper location relative to the switches on the control panel can be provided with upward movement for simultaneously setting to the active position the particular group of switches corresponding to the pattern of teeth on the template.

3,886,338
BAND OVERLAP DETECTOR SWITCH FOR CONTINUOUS RIBBON MANDREL

Terence M. Lokun, Conroe, Tex., and Peder Ulrik Poulsen, Fredensborg, Denmark, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 16, 1974, Ser. No. 433,962
Int. Cl. B65h *25/14*
U.S. Cl. 200—61.13 **2 Claims**



1. A band overlap detecting apparatus for a continuous ribbon mandrel having an endless forming surface provided by

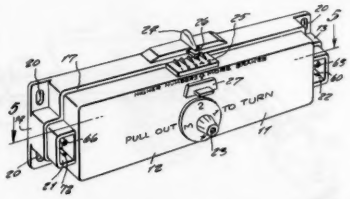
a continuously helically advanceable band helically wound in a plurality of side-by-side convolutions and having electric driving means for the band, comprising a first elongated member having a first end portion in operative engagement with a first one of the convolutions and an opposite second end portion mounted to accommodate pivotal movement of the member about an axis generally parallel to the axis of the helix defined by the helically wound band, a second elongated member spaced from the first member axially of the helix and extending generally parallel to the first member, the second member having a first end portion in operative engagement with a second one of the convolutions immediately preceding the first one operatively engaged by the first member, means mounting the second member on the first member at intermediate portions respectively thereof for pivotal movement of the second member with respect to the first member about an axis generally parallel to the axis of the helix, electric switch means mounted on one of the members and disposed between the mounted second end portion of the first member and the axis of pivotal movement of the second member with respect to the first member, the switch means having a pair of normally open contacts and a depressible actuator closing the contacts when depressed to complete a circuit through the electric driving means for the band, actuator depressing means mounted on the other of the members and engageable with the actuator of the switch means, and biasing means operatively connected to a second end portion of the second member and urging the actuator depressing means and the actuator toward each other to maintain the contacts of the switch means closed during normal operation of the mandrel, the biasing means also urging the first end portion of the second member rotatably about the axis of pivotal movement of the second member and toward the second convolution, whereby upon undesired overlapping of the first convolution by the second convolution, the second member is pivoted against the force of the biasing means to release the actuator and permit the contacts of the switch means to open and interrupt the circuit through the driving means for the band.

3,886,339

SENSING DEVICE FOR AUTOMATIC BRAKE SYSTEM INCLUDING INERTIA SWITCH WITH MAGNETIC HOLDING MEANS

Arthur R. Jubenville, deceased, late of 20 Grist Mill Ln., Halesite, N.Y., and by Irene L. Jubenville, administratrix, 20 Grist Mill Ln., Halesite, N.Y. 11743

Filed Dec. 26, 1973, Ser. No. 427,501
Int. Cl. H01h *35/02, 7/20*
U.S. Cl. 200—61.45 M **30 Claims**



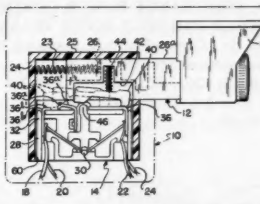
1. An acceleration sensing device comprising an acceleration sensing body, holding means, housing means enclosing said holding means, all means supported thereon and said sensing body in operative relationship, platform means supported on said holding means and forming a rest position normally supporting said acceleration sensing body, first and second switch means supported by said holding means on opposite sides of said platform means, each switch means including two contact means and moveable pole means having a bi-directionally deflectable end portion for closing onto said contact means, lever means forming a predetermined path having two continuous branches each branch extending on opposite sides of said platform means, each branch commencing with a first section adjacent to said platform means having an upwardly inclined concave curved shape followed by a substantially horizontal second section and concluding in a linearally upwardly inclined third section terminating adjacent to the edge of said holding means, the commencing end of each branch being connected to said deflectable end portion of said switch means, said body being moveable along said lever means in response to an acceleration having a component extending along the direction of said path, means biasing said body to normally remain on said rest position so that a predetermined force resulting from the last mentioned acceleration component is required to displace said body, whereby as said body traverses along the lever means said moveable pole means is deflected in one direction to close onto a first one of said contact means as said body engages a first part of said first section and said moveable pole means is deflected in the other direction to close onto the other of said contact means as said body engages the rest of said lever means, and damping means providing a restraining force as said body traverses said lever means.

3,886,340

MEANS FOR POSITIONING A MODULE IN AN ELECTRIC MOTOR CONTROL SWITCH

Robert W. Bittel, 11707 Woodview Boulevard, Parma Heights, Ohio 44130

Filed Aug. 14, 1972, Ser. No. 280,359
Int. Cl. H01h *9/02, 13/08*
U.S. Cl. 200—293 **14 Claims**



1. In a compact electronic switch for controlling an electric power unit comprising, a housing member, a switch module member received in said housing member, and means on said module member coacting with means on said housing member for positioning said module member in predetermined location with respect to said housing member, said means including projecting means comprising a laterally extending cam surface on said module member received in gripped relation between projecting finger means on said housing member.

3,886,341

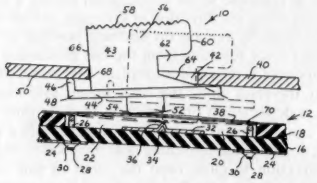
SWITCH OPERATING DEVICE FOR USE WITH AN OVER CENTER DIAPHRAGM SWITCH CONTACT ASSEMBLY WITH CONTACT RAMP CAMMING SURFACE

John W. Forrest, West Acton, Mass., assignor to Bowman/Ali, Inc., Acton, Mass.

Filed May 2, 1973, Ser. No. 356,631
Int. Cl. H01h *9/22*
U.S. Cl. 200—328 **7 Claims**

1. For use in an over center diaphragm switch contact assembly which includes a contact supporting board, a fixed contact, an over center diaphragm contact resiliently deformable from a first position spaced apart from said fixed contact to a second position in electrical contact therewith, and means for making electrical connections thereto, a switch operating device comprising a rigid guide plate fixedly mounted in generally parallel, spaced-apart relationship to said board and diaphragm contact, said plate having an elongated slot therein disposed in registry with said diaphragm contact, and a manually operable knob element having a guide portion positioned between said plate and diaphragm contact and slidably engag-

ing the surface of said plate proximal said diaphragm contact, said guide portion having a width greater than the width of said slot, a nib portion protruding from said guide portion and slidably engaging said diaphragm contact, a tab portion slidably received through said slot for longitudinal movement forwardly and rearwardly therein, and a ramp surface angled forwardly and downwardly from said tab portion to said guide



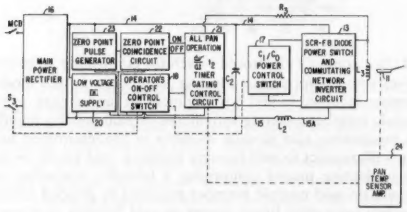
portion, said ramp frictionally, slidably engaging said proximal surface upon longitudinal movement of said tab portion forwardly in said slot thereby causing simultaneous downward movement of said device, said diaphragm contact being operated from said first to said second position thereof in response to said downward movement, said ramp surface frinctionally maintaining said diaphragm contact in said second position.

3,886,342

INDUCTION COOKING UNIT HAVING ALL PAN SAFE OPERATION, WIDE RANGE POWER CONTROL AND LOW START-UP AND SHUT-DOWN TRANSIENTS

Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Filed Apr. 26, 1973, Ser. No. 354,764
Int. Cl. H05b *5/04*
U.S. Cl. 219—10.49 **29 Claims**


MAIN POWER RECTIFIER
ZERO POINT PULSE GENERATOR
ZERO POINT COINCIDENCE CIRCUIT
ON OFF
ALL PAN OPERATION
LOW VOLTAGE DC SUPPLY
OPERATORS ON-OFF CONTROL SWITCH
TIMER GATING CONTROL CIRCUIT
POWER CONTROL SWITCH
SCR-FB DIODE POWER SWITCH AND COMMUTATING NETWORK INVERTER CIRCUIT
PAN TEMP SENSOR AMP

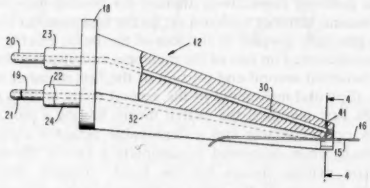
1. An induction heating unit including in combination inverter circuit means comprising gate controlled thyristor means and commutation circuit means coupled together in circuit relationship and excited from a set of power supply terminals, an induction heating coil coupled to and excited by said inverter circuit means in a manner such that the induction heating coil determines at least in part the operating frequency at which the inverter circuit means operates, and gating circuit means coupled to and controlling turn-on of said gate controlled thyristor means, said gating circuit means comprising feed back sensing circuit means coupled to said induction heating coil for deriving a feedback trigger signal synchronized with the frequency of operation of the inverter circuit circuit means, gating signal generator means for generating high frequency signal pulses having a repetition rate determined by the operation frequency for the inverter circuit means and of sufficient energy to insure turn-on of said gate controlled thyristor means, enabling means coupled to and enabling initiation of operation of said gating signal generator means, and alternating current signal coupling circuit means intercoupling said last mentioned enabling means with said feedback sensing circuit means for synchronizing the operation of the gating signal generator means with changes in frequency of the inverter circuit means due to loading and unloading of the induction heating coil.

3,886,343

POLYPHASE ARC STRIPPER

Paul M. Desautels, Poughkeepsie, and Lawrence P. Remsen, Stanfordville, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Oct. 17, 1973, Ser. No. 407,007
Int. Cl. B23p *1/02*
U.S. Cl. 219—68 **7 Claims**



4. Apparatus for stripping insulation from a wire comprising,

at least three electrodes,

electrode supporting means having

a wire receiving space,

means for supporting said electrodes about a point in said space midway between said electrodes,

means for locating a wire at said point,

and having arc transmitting holes between said electrodes and the wire receiving space,

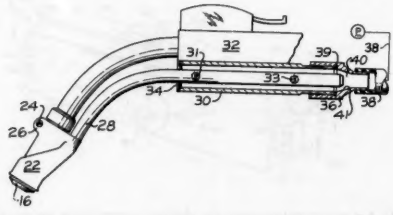
a polyphase power supply connected to said electrodes to produce arcs between pairs of electrodes in a rotating sequence for stripping insulation from a wire at said point.

3,886,344

WELDING FUME EXTRACTOR

John G. Frantzreb, Sr., Peoria, and Robert C. Hansen, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 107,097, Jan. 18, 1971. This application Apr. 25, 1973, Ser. No. 354,193
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 **15 Claims**



13. In a hand-held light-weight welding gun for use in a welding operation during which smoke and fumes are created, and including an electrical contact member and an associated gun nozzle defining an opening at the forward end thereof through which a shielding gas passes and a weld wire is fed to and contacted with said electrical member to feed electrical current into said wire and produce an arc between the end of said weld wire and a workpiece with the shielding gas surrounding the same, and further including a thermally conductive handle forming a part of said gun remote from said nozzle

and being connected to the nozzle by an arcuately curved gooseneck portion; the improvement comprising: means for cooling the handle and simultaneously collecting smoke, fumes, and shielding gas; said means comprising a collecting system including a member having a forward end adjacent to said nozzle opening defining an annular pickup chamber concentric with said nozzle and outwardly-facing orifice means spaced apart from and located rearwardly of said nozzle opening, said member including a rearward end disposed in radially offset relation to said nozzle and providing an exhaust outlet from said chamber; an extraction tube attached to said rearward end of the member in communicating relation with said exhaust outlet leading rearwardly from said pickup chamber; said extraction tube being coextensive with said gun in generally conforming relation to the arcuate underside of said gooseneck portion of the nozzle and at least a portion thereof integral with said handle and in thermal contact therewith; and vacuum suction means operatively connected to said extraction tube and having a capacity considerably greater than the volume of smoke and fumes created by the welding for also drawing ambient air into said collecting system to cool the handle, thereby drawing smoke, fumes, shielding gas and ambient air into said collecting system and simultaneously cooling the handle.

3,886,345

ELECTRICALLY HEATED GRAVY WARMING LADLE

Thelma E. Baisch, P.O. Box 615, Whittier, Calif. 90608

Filed Dec. 20, 1973, Ser. No. 426,820
Int. Cl. H05b *1/00;* **A47j** *43/28*
U.S. Cl. 219—227 **4 Claims**

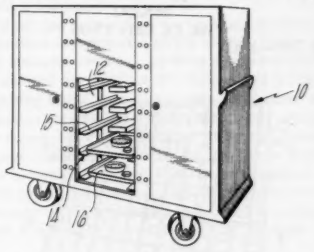
1. A ladle, comprising:
a bowl having a relatively thin free edge and being thicker at the bottom;
an electric heating element in said thicker part;
a handle for the bowl, said handle being inclined upwardly from said bowl;
an electric socket in the handle adjacent its free end;
and electric wires operably connecting the electric heating element with the socket;
a heat retaining metal insert in the bowl adjacent the heating element, said heat retaining insert being heated by the heating element when energized.

3,886,346

REHEATING AND RECONSTITUTION APPARATUS

Peter G. Meyers, Manchester, Conn., assignor to Meyers Systems and Technology, Inc., Manchester, Conn.

Filed Oct. 19, 1973, Ser. No. 407,926
Int. Cl. F27d *11/00*
U.S. Cl. 219—386 **12 Claims**



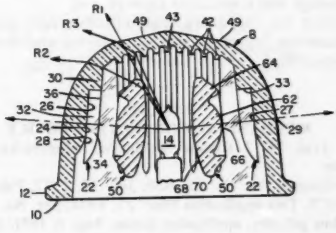
1. Apparatus for heating a material to be heated, including:
first thermoelectric means positioned on a first side of material at a first station to be heated, said first thermoelectric means having opposed hot and cold junctions, the hot junctions of said first thermoelectric means being positioned to serve as a heat source for said first side of the material to be heated;
second thermoelectric means positioned on a second side of the material to be heated, said second thermoelectric means having opposed hot and cold junctions, the cold junctions of said second thermoelectric means being positioned to serve as a heat sink for said second side of the material to be heated; and
infrared heating means positioned adjacent said second thermoelectric means to serve as a heat source for said second side of the material to be heated.

3,886,347

LUMINAIRE

William H. Dorman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,140
Int. Cl. F21v *5/08*
U.S. Cl. 240—1.2 **22 Claims**



1. A refractor in the general shape of two halves symmetric about a plane of symmetry, each of the refractor halves comprising:
a. an end section including an integral Fresnel-type lens; and
b. a center section in the general shape of a transversely elongated semi-frustocone having its base contiguous with the plane of symmetry, the center section including an array of lenticular prisms, the prisms having concave portions and convex portions both lying in planes parallel to the plane of symmetry.

3,886,348

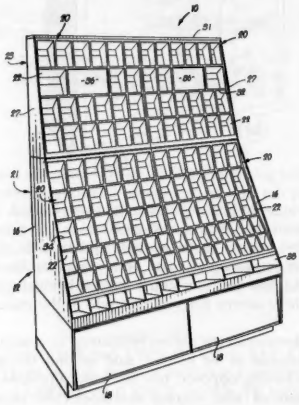
ILLUMINATED PRODUCT DISPLAY FIXTURE FOR EDGE LIGHTING DISPLAYED ARTICLES

Isaac Jonathan, Kansas City, Mo., and John W. Madden, Overland Park, Kans., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Continuation-in-part of Ser. No. 361,142, May 17, 1973, Pat. No. 3,821,538. This application May 10, 1974, Ser. No. 468,642

Int. Cl. F21v *33/00*

U.S. Cl. 240—2 AD 9 Claims



1. An illuminated product display fixture for displaying articles, comprising:

receptacle means having walls presenting at least a pair of inwardly extending, superposed, upper and lower pockets for the reception of articles to be displayed, the bottom wall of said upper pocket being of lesser surface area than that of the adjacent top wall of said lower pocket therebeneath, said top wall being translucent to permit passage of light therethrough;

a light source positioned in spaced relationship behind said receptacle means;

a reflector positioned in spaced relationship behind said light source, the reflector and light source being configured and positioned relative to said receptacle means to cooperatively direct light emanating from said source through said translucent top wall; and

structure for supporting said reflector, light source and receptacle means in article displaying and illuminating disposition.

3,886,349

MECHANICAL CONNECTING DEVICE

Akira Arai, 76, 2 Chome Soshigaya, Setagaya-ku, Tokyo, Japan

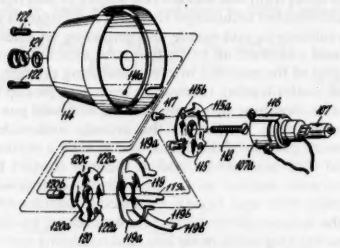
Division of Ser. No. 275,030, July 25, 1972, Pat. No. 3,832,075. This application Mar. 27, 1974, Ser. No. 455,449

Claims priority, application Japan, Aug. 5, 1971, 46-70016

Int. Cl. F21m *13/04*

U.S. Cl. 240—41 L 6 Claims

1. A projector lamp device comprising a cup shaped shell including a base wall having an opening therein and a forwardly directed peripheral skirt wall, a first plate disposed forwardly of said shell base wall and having an opening therein registering with said base wall opening, a sleeve secured to said first plate in registry with the opening in said first plate and projecting rearwardly through said base wall opening, means supporting said first plate on said shell base wall for angular adjustment of said first plate about angularly related axes, a lamp socket assembly disposed forwardly of said first plate and including a socket rear mounting plate, a spring member having a base section bearing on the front face of said first plate and having an opening registering with said first plate opening and a plurality of angularly spaced curved forwardly outwardly projecting leaf spring fingers extending from



said base section into engagement with peripherally spaced points on said socket rear mounting plate, a screw member secured to said socket rear mounting plate and projecting rearwardly loosely through said sleeve and an adjustable nut engaging said screw member rearwardly of said sleeve.

3,886,350

LIGHT PROJECTOR APPARATUS FOR CONTROLLING PROFILE OF LIGHT PROJECTION

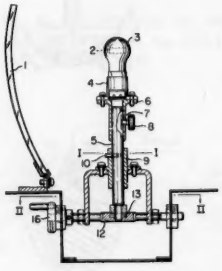
Kiichiro Katsukura; Kazuyoshi Katsukura, both of 14-4, 2-chome, Kamata, Ota-ku, Tokyo, and Taiji Sato, 3048 Hira-Kata, Koshigaya, all of Japan

Filed June 29, 1973, Ser. No. 375,157

Claims priority, application Japan, July 7, 1972, 47-67580

Int. Cl. F21v *19/02*

U.S. Cl. 240—44.2 5 Claims

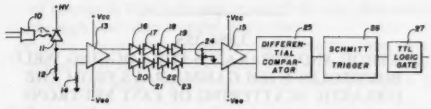


1. A light projector apparatus comprising: a reflector, an electric lamp having a light source within the bulb thereof and located at or near the focus point of the reflector, a rotating means for the electric lamp, the light source being an elongated luminous body rotatable between fixed positions transversely and longitudinally with respect to the surface of the reflector thereby obtaining a different profile of light emission when said rotating means is actuated and the light source is rotated to a new fixed position, and means for fixing the position of the light source with respect to the reflector at a plurality of different positions between the longitudinal and transverse positions.

3,886,351
OPTICAL-TO-ELECTRONIC INTERFACE CIRCUIT

Donald N. Williams, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 11, 1974, Ser. No. 449,814
Int. Cl. H01j *39/12*
U.S. Cl. 250—206 **7 Claims**

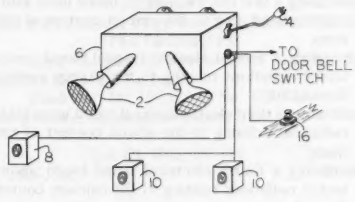


1. An optical-to-electronic interface circuit comprising:
a photo-responsive means positioned to receive light signals for developing electrical output signals as a function of said light signals;
a first differential amplifier connected to receive said electrical output signals as a first input, and a known fixed reference as a second input for generating first and second output signals having a differential therebetween as a function of the differential between its received inputs;
a second differential amplifier;
first and second unidirectional current paths connecting said first and second output signals as inputs to said second differential amplifier; and
a differential comparator connected to receive the output signals of siad second differential amplifier for generating a signal as a function of the difference between said output signals developed by second differential amplifier.

3,886,352
LIGHT AND CHIME CONTROL SYSTEM

Thomas K. Y. Lai, 38 A Niolopa Place, Honolulu, Hawaii 96800

Continuation-in-part of Ser. No. 242,351, April 10, 1972, Pat. No. 3,790,848. This application Oct. 25, 1973, Ser. No. 409,662
Int. Cl. G08g *1/14*; **G10k** *3/00*; **H05b** *41/36*
U.S. Cl. 250—215 **9 Claims**



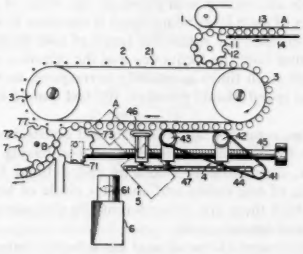
1. A system for responding to intentionally indicated presence of persons comprising a power source,
a response means connected to the power source for receiving power from the source and performing a discernible response,
a controller connected to the source and to the response means for selectively completing a circuit from the source to the response means, whereby the response means operates,
a time delay means connected to the controller for delaying complete operation of the response means,
intentionally activated indicator means connected to the controller for setting the controller and time delay means in operation upon actuation of the indicator means wherein the intentionally activated indicator means comprises an automobile presence sensing indicator means and a doorbell pushbutton switch mounted along side of a door, wherein the response means comprises door chime means, and wherein the controller comprises a circuit connected between the indicator and the chime for ringing a first tone of a chime and wherein the time delay means comprises an electronic time delay for delaying a ringing of a second tone of a chime thereby to differentiate between indicator means activated by a doorbell pushbutton switch and by the automobile presence sensing indicator.

6. The system for responding to intentionally indicated presence of persons comprising a power source, an intentionally activated indicator means comprising a doorbell pushbutton switch mounted near a door of a house and a response means comprising lights associated with the house, and a controller means comprising an electronic circuit connected to the power source, to the pushbutton and to the lights and including a time delay means for supplying power from the power source to lights associated with the house after a time delay which is consistent with a normal human response to a doorbell, whereby a person pressing a doorbell is aware of a normal human response to the ringing of the doorbell.

3,886,353
AUTOMATIC CONTINUOUS CONTAINER INSPECTING METHOD AND APPARATUS

Kazuhisa Shioya, Tokyo, Japan, assignor to Tatibana Works, Limited and Diichi Seiyaku Company, Limited, both of Tokyo, Japan

Filed Dec. 28, 1973, Ser. No. 429,666
Claims priority, application Japan, Dec. 29, 1972, 48-1309; Dec. 29, 1972, 48-1310; Dec. 29, 1972, 48-1311; Dec. 29, 1972, 48-1452
Int. Cl. H01j *39/12*
U.S. Cl. 250—223 B **28 Claims**



1. A continuous container inspecting method comprising the steps of:
revolving each of the containers which are pervious to light;
moving said containers in line continuously;
projecting light to each of the linearly moving containers and detecting flaws on and alien matter in each of the containers by a detecting means provided stationarily and perpendicularly to the direction of movement of the containers and having a wider range of view in the direction of movement of the containers than the container.

3,886,354

ARRANGEMENT FOR OPTICAL SCANNING OF THE SPEED OF A ROTATING DEVICE SUCH AS A VEHICLE WHEEL

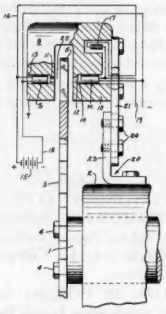
Lennart Bror Anders Swidén, Bjornsbacken 32, S-59061 Vreta Kloster, and Waldemar Lester, Bondegatan 11B, S-582-63 Linkoping, both of Sweden

Filed Feb. 1, 1974, Ser. No. 438,729

Claims priority, application Sweden, Feb. 6, 1973, 73015935

Int. Cl. G01d 5/36

U.S. Cl. 250—233 2 Claims



2. In rotational speed information apparatus of the type comprising a light source for producing a substantially constant intensity light emission, and a photoresponsive device which responds to reception of light emission from said source with an electrical output of one level and to non-reception of such emission with an electrical output of another level but which may have unpredictable and unequal inherent delays in its responses to the beginning and ending, respectively, of its reception of such emission, means for causing the output of said photoresponsive device to correspond to the rotational speed of a rotatable member and to consist of pulses at one of said levels alternating with pulses at the other of said levels, the pulses of each level being equal in duration to those of the other level when the rotational speed of said member is constant so that both the frequency and the duration of pulses of each level at all times accurately correspond to the existing rotational speed of said member, the last named means comprising:

A. a disc rotatable about an axis and constrained to rotate with the rotatable member, said disc having an annular zone, concentric to said axis and defined by an inner circle of one radius and an outer circle of larger radius, in which there are circumferentially alternating transparent and opaque areas,

1. each area of one of said kinds being defined from its circumferentially adjacent areas of the other of said kinds by opposite edges that are parallel to one another and equidistant from said radius to a radius from said axis,
2. each area of each of said kinds being uniform with all other areas of its kind, and
3. all of said areas being of equal circumferential extent on a median circle which is concentric to said axis and has a radius intermediate the radii of the inner and outer circles;

B. supporting means fixing the light source and the photoresponsive device in such alignment with one another as provides for reception by the device of light emissions from the light source and in such spaced apart relationship that said zone of the disc is interposed between them for intermittent interruption of such reception during rotation of the disc; and

C. mounting means confining said supporting means to adjusting motion in directions radial to the disc axis by which the light source and photo-responsive device can be established at the position between the inner and outer circles at which said delays are compensated for by differences between the circumferential extents of the respective kinds of areas, said mounting means providing for fixing the supporting means in any such position of adjustment.

3,886,355

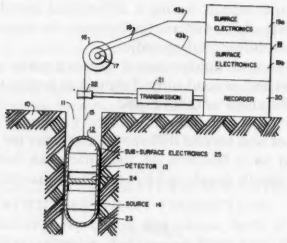
METHOD AND APPARATUS FOR LOGGING WELL BOREHOLES WITH GAMMA RAYS FROM THE INELASTIC SCATTERING OF FAST NEUTRONS

Richard B. Culver, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 146,332, May 24, 1971, Pat. No. 3,787,686. This application Oct. 3, 1972, Ser. No. 294,715

Int. Cl. G01t 1/16

U.S. Cl. 250—270 4 Claims



1. A method of well logging comprising the steps of:

irradiating the formations surrounding an earth borehole with high energy neutrons;

detecting radiations emanating from said formations resulting from said formations being irradiated by said neutrons;

generating a first electrical signal based upon said detected radiations relating to the carbon content of said formations;

generating a second electrical signal based upon said detected radiations relating to the oxygen content of said formations;

generating a third electrical signal based upon said detected radiations relating to the silicon content of said formations;

generating a fourth electrical signal based upon said detected radiations relating to the calcium content of said formations;

generating a fifth electrical signal functionally related to the ratio of said first and second signals;

generating a sixth electrical signal functionally related to the ratio of said third and fourth electrical signals; and

modifying said fifth electrical signal as a function of a characteristic of said sixth electrical signal.

3,886,356

OPTICAL INSPECTION APPARATUS

Thiel J. Gomm, and Stephen E. Price, both of Salt Lake City, Utah, assignors to Inex, Inc., Denver, Colo.

Continuation of Ser. No. 395,944, Sept. 10, 1973, abandoned. This application Oct. 29, 1973, Ser. No. 410,538

Int. Cl. H01j 39/12

U.S. Cl. 250—223 B 12 Claims

1. An optical inspection apparatus, comprising in combination:

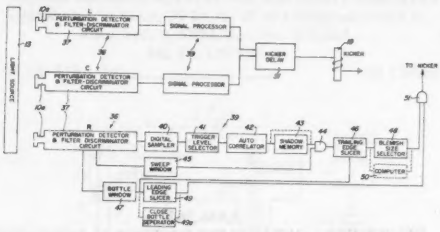
a housing;

a light source within the housing for illuminating an object capable of transmitting light therethrough;

means for transporting said object through the housing to be inspected therein;

a solid state scanning means adapted to sweep vertically to receive light transmitted through the object, said scanning means having the capability to generate signals having deviations in characteristics proportional to the rate of change in light intensity received therein after passing through said object under inspection;

circuitry means for providing signal suppression except when an item under inspection is in a preferred viewing area, providing thereby a window through which the



signals from the scanning means are analyzed, said window representing successive portions of the object under inspection wherein the presence of changes in light transmission characteristics are indicative of a defect in the object;

means for analyzing the signal from said circuitry means to determine the presence of a defect in the object under inspection;

timer means for delaying signals transmitted from the analyzing means and for holding said signals a period of time until an object determined to have a defect passes out of the range of the scanning means; and

means for receiving signals from the timer means and for removing the object determined to have a defect from the transporting means.

3,886,357

MULTIPLE ION BEAM TYPE DOUBLE FOCUSING MASS SPECTROMETER

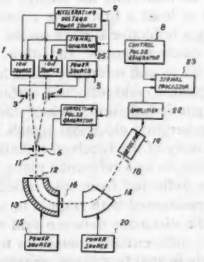
Motohiro Naito, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,923

Claims priority, application Japan, Dec. 18, 1972, 47-126947

Int. Cl. H01j *391/34*

U.S. Cl. 250—285 **10 Claims**



1. In a double focusing mass spectrometer comprising an electrostatic analyzer with adjustable power supply, a magnetic analyzer with adjustable power supply, at least one baffle with an aperture therein between said electrostatic and magnetic analyzers, an ion detector and a plurality of ion sources, the improvement comprising means for guiding the plurality of ion beams emitted from said sources along a common path in a single ion beam to the electrostatic analyzer,

individually adjustable power supplies for each ion source,

adjusting circuit means associated with at least one of the adjustable power supplies for adjusting the ratio of the ion source accelerating voltages and the electric field strength of the electrostatic analyzer, said adjusting circuit means including a control pulse generator for directing the adjusting circuit means for some period of time to pass more than one ion beam to the magnetic analyzer but for that period to pass no more than one ion beam from a given source continually to the magnetic analyzer and to pass the ion beam from at least one source intermittently to the magnetic analyzer, means associated with at least one of the adjustable power supplies for sweeping the ratio of the energy of the ion beams passing the electrostatic analyzer and the magnetic field strength of the magnetic analyzer such that the detector detects time shared multiple signals indicative of the mass to charge ratios of ions comprising the ion beams passed to the magnetic analyzer.

3,886,358

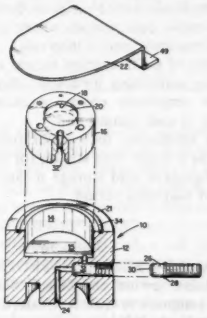
SPECIMEN TRANSFER CONTAINER FOR ION MICROPROBE MASS ANALYZER

John F. McLaughlin, Oak Ridge, and Stephen S. Cristy, Clinton, both of Tenn., assignors to The United States Energy Research and Development Administration, Washington, D.C.

Filed May 23, 1974, Ser. No. 472,929

Int. Cl. G01t *1/16*

U.S. Cl. 250—289 **4 Claims**



1. A specimen holder for use with an ion microprobe mass analyzer to provide for the transfer of a specimen to be analyzed from a specimen-loading facility to a specimen-analyzing chamber exhaustable to a predetermined pressure in said analyzer without exposing the specimen to an atmosphere reactive with the specimen, comprising an open housing having a receptacle at one end thereof for receiving a specimen container through the opening, sealing means at said open end of the housing disposed about said receptacle, removable lid means adapted to be disposed over said receptacle at said one end thereof in a contacting relationship with said sealing means, a passageway projecting into said housing in registry with said receptacle for placing said receptacle in communication with a source of vacuum to a pressure corresponding to said predetermined pressure for evacuating said receptacle and pulling said lid means against said sealing means for enclosing said receptacle, and valve means in registry with said passageway for selectively opening and closing said passageway, with said lid means being affixed to said housing upon

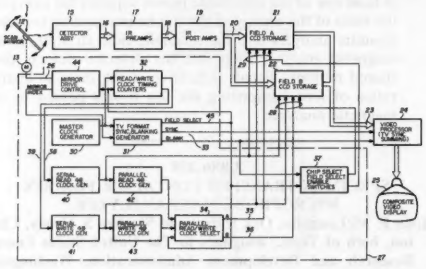
evacuation of said receptacle and closing of said passageway by said valve means, whereby when said holder is positioned within the analyzer chamber and when said chamber is at said predetermined pressure, the cover is released from said contacting relationship with said sealing means so that the specimen may be analyzed.

3,886,359

TIME INTERVAL COMPRESSION ADDRESS SEQUENTIALLY

Tom F. Cheek, Jr., Dallas, and Thomas R. Patrick, Austin, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 4, 1974, Ser. No. 430,982
Int. Cl. G01t 1/16
U.S. Cl. 250—334 **19 Claims**



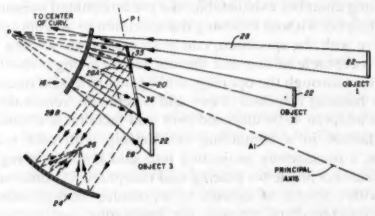
1. In an analog data system, the combination which comprises:
   a. a signal sampling generating means to generate a set of time spaced samples of each of a plurality of concurrent time-amplitude-variable signals during each of a plurality of successive data periods where said samples are taken at uniform time spaced intervals,
   b. two sets of CCD storage means coupled to the signal sampling generating means to alternately store a set of variable amplitude charge packets derived from said samples of said signals, and
   c. means alternately to transfer from said CCD storage means as a single data stream for display all the samples of all signals in said storage means in an interval of the order of said data period.

3,886,360

INFRARED INTRUSION DETECTION APPARATUS

Martin H. Reiss, Newton, and Elias E. Solomon, Duxbury, both of Mass., assignors to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,065
Int. Cl. G01t 1/16
U.S. Cl. 250—338 **14 Claims**



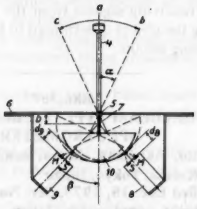
1. Optical apparatus for an infrared intrusion detection system comprising;
   a sensing element for providing an electrical signal corresponding to the level of infrared radiation impinging on the element,
   a convex reflective surface for receiving the radiation from objects in the field of view and reflecting at least some of the radiation in rays parallel to the principle axis of the convex reflective surface,
   an array of spaced reflective surfaces disposed to receive the rays from said convex surface,
   and a collector reflector for receiving radiation reflected from at least one of said reflective surfaces of said array and directing said radiation to said sensing element.

3,886,361

DEVICE FOR CONTACTLESS POSITIONAL INDICATION

Kaj Dennis Georg Wester, Sodertalje, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 19, 1973, Ser. No. 408,158
Claims priority, application Sweden, Oct. 26, 1972, 13838/72
Int. Cl. G01d 5/34
U.S. Cl. 250—338 **5 Claims**

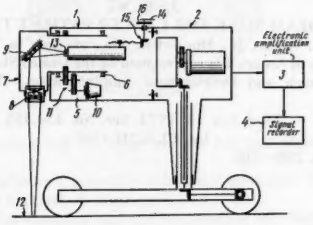


1. Apparatus for indicating the change in the position of a moving body in at least a first plane relative to a reference plane comprising a reflective surface on the body, at least one transmitter of electromagnetic radiation, said transmitter being fixed relative to said reference plane for directing radiation in said first plane to said reflecting surface and two receivers of electromagnetic radiation, each of said receivers including means for generating electrical signals having values related to the intensity of the received radiation, said receivers being fixed relative to said reference plane and positioned to receive radiation reflected from said reflective surface, said receivers being positioned with respect to said reflective surface such that the distances between said receivers and said reflective surface differentially change for translational movements of the body in said first plane whereby such movement of the body in the first plane increases the value of the electrical signal generated by the generating means of one receiver while decreasing the value of the electrical signal generated by the generating means of the other receiver.

3,886,362
METHOD AND APPARATUS FOR THERMAL EXAMINATION OF THE INTERIOR SURFACE OF ANNULAR STATOR PACKS FOR ELECTRICAL MACHINES

Mikhail Mikhailovich Miroshnikov, Ulita Kartashikhina, 31, kv. 65; Evgeny Nikolaevich Mineev, ulitsa Matrosa Zheleznyaka, 19, kv. 4; Konrad Saakovich Karapetian, Krasnaya ulitsa, 53, kv. 5; Roza Nikolaevna Ivanova, ulitsa Grota, 1/3, kv. 5; Vasily Vasilievich Romanov, Naberezhnaya Chernoi rachki, 18, kv. 30; Sergei Nikolaevich Kurnakov, ulitsa Aviatsionnaya 13, kv. 91; Garri Mikhailovich Khutoretsky, Alataiskaya ulitsa, 20, kv. 5; Ivan Ivanovich Elin, Derptsky pereulok, 11, kv. 16; Valentin Mikhailovich Bykov, ulitsa Matrosa Zheleznyaka, 19, kv. 45, and Dmitry Dmitrievich Valchikhin, 10 Linia, 29 kv. 6, all of Leningrad, U.S.S.R.

Filed Apr. 9, 1973, Ser. No. 349,665
Int. Cl. G01t *1/16*
U.S. Cl. 250—340 **10 Claims**

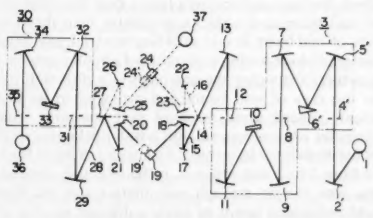


1. A method for examining annular active-steel stator packs for an electric machine comprising heating the active steel of a stator pack, introducing an infrared heat sensor and optical receiver into the bore of the stator pack, uniformly moving said infrared heat sensor and optical receiver along the axis of the stator pack while rotating the optical receiver within the stator pack so that heat radiation is received by the sensor from the entire inner periphery of the cross-section of the stator to provide a continuous examination of the entire inner surface of the stator, and recording the effect of heat radiation received by the sensor to determine the presence of overheated areas of the stator.

3,886,363
SPECTRO FLUORESCENCE AND ABSORPTION MEASURING INSTRUMENT

Yasushi Ohnishi, and Masamichi Tsukada, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 17, 1974, Ser. No. 434,236
Claims priority, application Japan, Jan. 20, 1973, 48-8958
Int. Cl. G01n *21/26*
U.S. Cl. 250—364 **13 Claims**

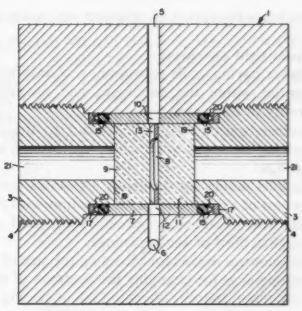


1. A spectrophotofluorometer comprising a light source, a first spectroscope for dispersing light from said light source, a specimen disposed at a position to which exciting light from said first spectroscope is directed, first light beam chopping means arranged between said specimen and said light source for selectively directing exciting light from said first spectroscope to said specimen, a second spectroscope for dispersing secondary light emitted by said specimen due to said exciting light, a detector for detecting the light dispersed by said second spectroscope, second light beam chopping means rotating synchronously with said first light beam chopping means and disposed between said detector and said specimen for selectively directing secondary light emitted by said specimen due to said exciting light to said detector, and a phase variable mechanism for varying the relative rotary phase angle between said first and second light beam chopping means based on the physical and chemical properties of said secondary light emitted by said specimen due to said exciting light.

3,886,364
HIGH PRESSURE INFRARED CELL

Wellington E. Walker, Charleston; Lowell A. Cosby, St. Albans, and Sterling T. Martin, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 371,352, June 19, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,437
Int. Cl. G01m *1/10*
U.S. Cl. 250—343 **6 Claims**



1. An infrared cell capable of use in analyzing materials while at high temperatures and pressures and while passing continuously through said cell, comprising an aperture extending through said cell, an inlet for transmitting materials to be analyzed to a point in said cell located within said aperture, an outlet located in said cell for removing such material from said point and thereafter from said cell, a cell block encompassing said aperture and said inlet and outlet, an open metal sleeve located within said aperture having holes mated with said inlet and said outlet into the aperture, two infrared light transmitting windows located in said sleeve having geometric designs conforming to the interior of said sleeve, and being located one on each side of said holes and being spaced from one another by a spacing means, two plugs fitted into and secured in each end of said aperture each of which contains an inner optically flat surface which has been ground and polished to within about one wavelength interference of sodium light and are each in direct contact with a window surface, the inner end portions of each plug having a cross-sectional area normal to the axis of the aperture which is smaller than the internal cross-sectional area of the sleeve, having a geometric shape conforming to the internal shape of the sleeve, and being located within the separate ends of the sleeve, each of said portions being circumscribed by two sealing means, the first sealing means is in direct contact with an end surface of said sleeve and is out of contact with said window, and the second sealing means is removed from the sleeve end surface by the first sealing means and holds the first sealing means in position when the first sealing means is expanded by applied pressure, an infrared light transmitting hole located in each plug, heating means provided in said cell block

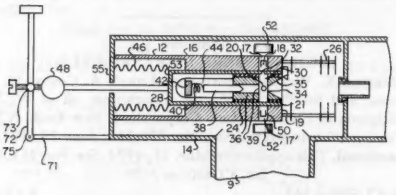
and means in said cell block for controlling and monitoring the temperature in the cell block.

3,886,365

MULTICONFIGURATION IONIZATION SOURCE

William P. Kruger, Los Altos Hills, and John A. Michnowicz, Santa Clara, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 27, 1973, Ser. No. 391,721
Int. Cl. H01b *39/34*
U.S. Cl. 250—423 **10 Claims**



1. A multiconfiguration, multimode ionization source comprising:

a vacuum tight envelope;

a chamber having walls surrounding an internal cavity and mounted within the envelope, said chamber having a plurality of openings;

an electron source disposed exterior to the chamber for supplying electrons to the chamber through a first of said openings;

sample inlet means for supplying a gaseous sample through a second of said openings for reaction with the electrons inside the chamber to create ions, said ions exiting through a third of said openings;

aperture control means for changing the size of the first and third openings for changing the pressure of the sample in the chamber, thereby changing the operating mode of the source from a first to a second ionization mode; and

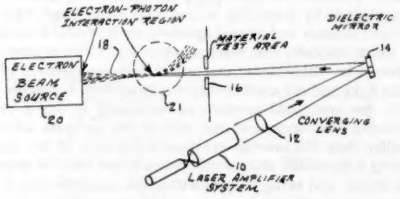
ion repelling means disposed inside the chamber for repelling ions out of the chamber through the third opening.

3,886,366

COMPTON BACK-SCATTERED RADIATION SOURCE

Sidney W. Kash, Manhattan Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 13, 1973, Ser. No. 350,855
Int. Cl. H01j *37/00*
U.S. Cl. 250—493 **3 Claims**



1. A Compton back-scattered radiation apparatus comprising in combination:

a laser amplifier system for producing an intense laser beam of optical photons;

a converging lens positioned in said laser beam's path to focus said laser beam;

a dielectric mirror positioned to reflect said laser beam at an angle equal to the angle of incidence;

an electron beam source for producing a high-energy high-intensity relativistic, electron beam, said electron beam being directed counter to the direction of said laser beam and intersecting said laser beam along its path length;

an interaction region positioned between said electron beam source and said dielectric mirror, said electron beam being in collision with said laser beam within said interaction region, said laser beam photons being increased in energy by being back-scattered by said electron beam and

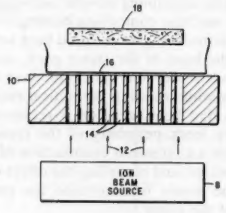
a target positioned between said interaction region and said dielectric mirror to receive said backscattered laser beam photons, said target having an opening therein; said opening being positioned to allow passage of said reflected laser beam toward said interaction region.

3,886,367

ION-BEAM MASK FOR CANCER PATIENT THERAPY

John G. Castle, Jr., Huntsville, Ala., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 18, 1974, Ser. No. 434,458
Int. Cl. G21f *1/00*
U.S. Cl. 250—505 **3 Claims**



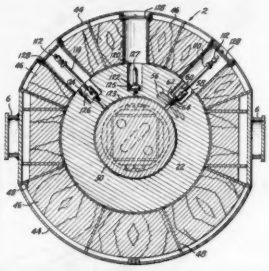
1. A radiation mask for mitigating the surface tissue effects of a radiotherapeutic treatment of embedded tumors in a patient by means of a beam of fast ions from a beam source, comprising:

a block of radiation shielding material positioned in said beam intermediate the patient and said beam source, said block having a surface area larger than the cross section of said beam and a thickness greater than the range of ions of said beam in said shielding material, said shielding material block having a plurality of circular cross section apertures extending therethrough in a direction parallel to the rays of said beam and arranged in an orderly, evenly spaced array, each of said apertures having a diameter (d) and spaced with a wall thickness (w) therebetween defined by $d = w = F\sigma_r$, with f being in the range of from 1 to 2 and where σ_r is the effective dispersion of the ions passing through said apertures at the depth of said embedded tumor to attain sufficient overlap of discrete beam portions passing through adjacent ones of said apertures at the depth of the Bragg peak for said beam source coincident with the tumor region, thereby providing a lateral uniformity of radiation dose over the irradiated area of said tumor while shielding a substantial are of skin and intervening tissue.

3,886,368
SPENT FUEL SHIPPING CASK

Jack D. Rollins; Ralph E. Best, both of Gaithersburg; Robert R. Riggs, Linthicum Heights; Clifford J. Anderson, Buckeystown, all of Md., and Victor J. Barnhart, Boston, N.Y., assignors to Nuclear Fuel Services, Inc., Rockville, Md.

Filed Feb. 27, 1973, Ser. No. 336,191
Int. Cl. G21f *5/00*
U.S. Cl. 250—507 **18 Claims**



1. A shipping cask for spent nuclear fuel assemblies, comprising:

means defining a generally cylindrical enclosure having a closed end and an open end;

gamma ray shielding material surrounding said enclosure;

neutron shielding means extending circumferentially around said gamma ray shielding material comprising means defining a plurality of separate longitudinally extending compartments for bodies of liquid material capable of absorbing neutrons;

pressure relief means for each of said compartments; and

each of said compartments comprising a main portion and a surge tank portion separated therefrom by a partition, a small passageway through said partition, and means at said passageway for holding a body of said liquid in closing relation to said passageway throughout a substantial range of tilting of said cask to thereby prevent air from flowing from said surge tank portion into said main tank portion.

3,886,369
SOLID-STATE GATING CIRCUIT FOR CROSS-POINT SWITCHING

Virgle E. Porter, Sieger, Ill., assignor to The Sippican Corporation, Midlothian, Ill.

Filed Feb. 11, 1974, Ser. No. 441,407
Int. Cl. H01j *39/12*
U.S. Cl. 250—551 **14 Claims**

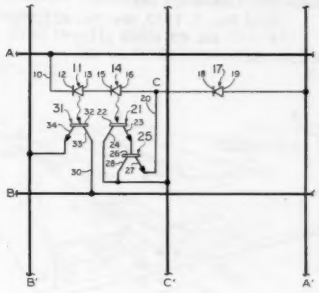
7. A gating circuit comprising:

control means, having an isolation diode and a light emitting diode for producing light energy when current passes therethrough;

an electrical conductor, susceptible to receiving spurious signals, coupled through said circuit isolation means to said light emitting means;

a by-pass path, having a first photo-sensitive transistor disposed in optical relationship with said light emitting diode for energizing said isolation diode upon receipt of light energy from said light emitting diode; said isolation diode, upon energization, causing current passing through said light emitting diode to be diverted to said by-pass path; and

a signal circuit, electrically isolated from said control means, said by-pass path and said electrical conductor, having a second photo-sensitive transistor disposed in optical relationship with said light emitting diode for electrically closing said signal circuit upon receipt of said light energy from said light emitting diode, whereby said light emitting means are electrically isolated from said

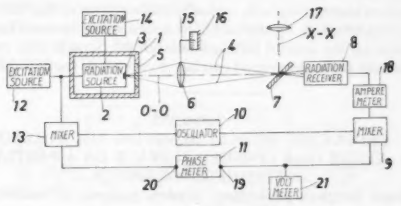


electrical conductor upon energization of said circuit isolation means.

3,886,370
DEVICE FOR MEASURING SEMICONDUCTOR RADIATION SOURCES

Walter Schubert, 36, Emil-Hollein-Strasse; Harry Wendt, 2, Strasse der Gargend, both of Jena, and Reiner Doss, 2 F, Moldaustrasse, Teltow, all of Germany

Filed Nov. 21, 1973, Ser. No. 254,787
Int. Cl. H01j *39/12*
U.S. Cl. 250—552 **8 Claims**



1. A device for measuring the local dependence of the intensity and the delay time of the recombination radiation on the radiation band of a semiconductor radiation source, comprising

a semiconductor radiation source having a radiation surface,

an excitation source for exciting periodic radiation of said semiconductor radiation source,

a radiation receiver for receiving said radiation and transforming the periodic radiation signals into electric signals,

a magnifying optical system,

a diaphragm being radiation transmissive,

said system and said diaphragm being located between said semiconductor radiation source and said radiation receiver,

said system being traversed by said radiation, which images said radiation surface on said diaphragm and has a common optical axis with said radiation surface, said diaphragm and said radiation receiver,

means for producing relative motion between the image of said radiation surface and said diaphragm,

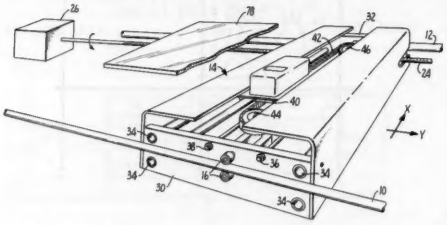
and a phasemeter connected to said radiation receiver and said excitation source for comparison of the phase of the signal in said radiation receiver and the phase of the excitation signal.

3,886,371

OPTICAL CHARACTER READER SCANNING SUPPORT MECHANISM

Lester John Lloyd, Orinda, Calif., assignor to Ball Computer Products, Inc., Oakland, Calif.

Filed Dec. 3, 1973, Ser. No. 421,396
Int. Cl. G01n 21/30
U.S. Cl. 250—567 6 Claims



1. A scanning support mechanism movable in orthogonal X and Y directions comprising a first carriage, means for incrementally moving the first carriage in the Y direction, a second carriage movably mounted on the first carriage, constant speed drive means mounted on the first carriage, and reciprocating means powered by the constant speed drive means for shuttling the second carriage in the X direction, the reciprocating means including a pair of pulleys mounted on the first carriage so as to rotate in a plane substantially parallel to both the X and Y directions, at least one of the two pulleys being driven by the constant speed driving means, a driving belt connected between the two pulleys, Scotch yoke means mounted on the second carriage, and a pin rigidly mounted at one end in the Scotch yoke means and attached at its other end to the driving belt, whereby the rotation of the belt at a constant speed by the constant speed drive means exerts a force on the second carriage through the Scotch yoke means so as to cause the second carriage to shuttle in the X direction.

3,886,372

PRODUCING SIGNALS DENOTING LOCATION OF EDGES OF A FINISHED SURFACE ON A PARTLY FINISHED WORKPIECE

Benkt Sanglert, Jonkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Feb. 25, 1974, Ser. No. 445,429
Claims priority, application Sweden, Feb. 23, 1973, 7302543
Int. Cl. G01b 11/02
U.S. Cl. 250—571 3 Claims

2. Apparatus for scanning an unfinished elongated workpiece that has a substantially flat top surface which terminates at a pair of opposite longitudinally extending edges, to produce signals which are related to the orientation and configuration of said side edges and their spacing from one another, said apparatus comprising:

A. supporting means for holding a workpiece stationary with its top surface horizontal and its length extending in a predetermined direction;

B. photoresponsive detector means mounted in upwardly spaced relation to the supporting means and facing substantially in said direction;

C. means connected with said detector means for causing the same to scan repeatedly along a horizontal path transverse to said direction;

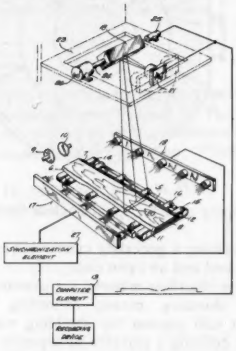
D. reflector means having a reflecting surface;

E. means mounting the reflector means for rotation about an axis which is parallel to said reflecting surface, said axis being

1. horizontal, spaced above said supporting means, and transverse to said direction, and

2. so spaced from the detector in said direction that the reflector means can reflect to the detector means, for scanning thereby, an image of a zone which extends entirely across a workpiece on the supporting means, and which zone moves lengthwise along the workpiece, from one end to the other thereof, as the reflector rotates;

F. means for rotating the reflector at a rate so related to the rate of repetitive scanning that the imaged zone of the workpiece that is scanned by the detector means advances lengthwise along the workpiece from scan to scan; and



G. means comprising at least a pair of light sources located at opposite sides of said supporting means for illuminating at least that zone of a workpiece which is imaged by the reflector means, at a low angle of incidence to the top surface of the workpiece and alternately from opposite sides thereof in synchronism with scanning by the detector means, so that illumination does not extend beyond each of said edges of the workpiece when the scan reaches the vicinity thereof.

3,886,373

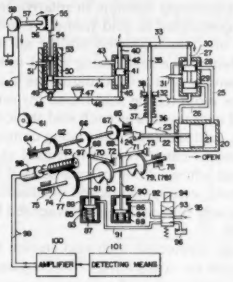
HYDRAULIC MACHINE CONTROL APPARATUS

Masayasu Okada, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 4, 1973, Ser. No. 393,916
Claims priority, application Japan, Sept. 4, 1972, 47-87972; Nov. 29, 1972, 47-118981; Jan. 29, 1973, 48-11069; Feb. 12, 1973, 48-16633; Mar. 9, 1973, 48-27002
Int. Cl. F01b 25/00
U.S. Cl. 290—52 11 Claims

1. Control apparatus for hydraulic machines that are arranged so as to receive hydraulic fluid commonly from a single penstock connected at its upper portion to an upper reservoir and connected at the lower regions of the system to a plurality of hydraulic machines by branch penstocks with the provision of a single surge tank common to the hydraulic machines, which hydraulic machines have movable guide vanes for controlling the flow of hydraulic fluid through the machines, respectively, comprising: monitoring means for producing an electric signal in response to transitional operation of at least one of the hydraulic machines; movably mounted cam means; operating means responsive to said electric signal for moving

said cam means; and adjusting means responsive to the movement of said cam means for controlling the degree of opening



of the guide vanes of at least one of the other hydraulic machines.

3,886,374

LOCKABLE SLIDE FITTING FOR A SAFETY BELT SYSTEM

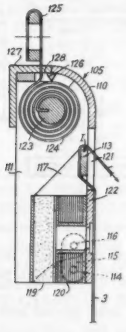
Andre Lefeuvre, Noisy-le-Roi, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of Paris, France

Filed Sept. 7, 1973, Ser. No. 395,158

Claims priority, application France, Feb. 14, 1973, 73.05211; Oct. 5, 1972, 72.35394

Int. Cl. H01h *35/00*

U.S. Cl. 307—10 SB **8 Claims**



1. A lockable slide fitting for use in a vehicle safety belt system of the "lap and diagonal" type having three points of attachment and comprising a fixed reel device for one end of a shoulder strap which strap may slide through the lockable slide fitting before passing diagonally across the chest of the vehicle occupant to be anchored by its other end in the vicinity of the floor, the said lockable slide fitting comprising a frame, means for attaching the frame to a component of the body of the vehicle, means including a movable cross bar slidably mounted in the frame for movement between a first position in which the strap is locked and a second position and over which the strap may pass, an arm hinged to the frame of the fitting, at least one rod connecting said cross bar to said arm, an armature of ferro-magnetic material supported by said arm, a coil carried fixedly by said frame and co-operating with the armature, and means for connecting said coil to an electric circuit to energize the coil.

3,886,375

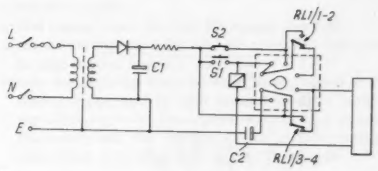
COUNTING SYSTEM

Walter Ulo Sirk, Oakham, and Douglas Brian Street, Melton Mowbray, all of England, assignors to The Production Engineering Research Association of Great Britain, Leicestershire, England

Filed Dec. 11, 1973, Ser. No. 423,785

Int. Cl. H01h *35/00*

U.S. Cl. 307—112 **8 Claims**



1. A component counting system for a machine tool, comprising: first switch means positioned to detect the presence in the machine of a component to be machined; second switch means arranged to be operated by the machine after initiation of the machine cycle; and a counter to which said first and second switch means are connected so that a count is recorded only if both the first switch means detects the presence of a component and the second switch means is operated.

3,886,376

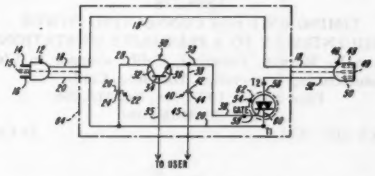
LOW POWER REMOTE SWITCH DEVICE

Satya Pal Asija, 1641 Cumberland St., Apt. 21, St. Paul, Minn. 55117

Substitute for Ser. No. 804,052, Feb. 27, 1969, abandoned. This application Oct. 23, 1973, Ser. No. 408,663

Int. Cl. H03k *17/00*

U.S. Cl. 307—116 **3 Claims**



1. Apparatus for turning off an electrical appliance as a person falls asleep, which comprises a low power solid state control circuit for controlling higher power control circuit which includes:

a. conductor means including solid state means for connection to a source of electrical energy of a given voltage;

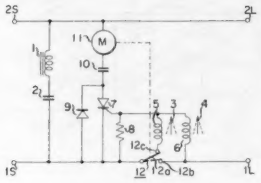
b. output means for connecting the conductor means to an electrical appliance comprising a bi-directional silicon controlled rectifier having a gate and a base; and

c. switch means including solid state means operable at less than the given voltage and joined to the conductor means for controlling flow of electrical energy to the output means, where in the switch means includes a transistor in series with the gate of the bi-directional silicon controlled rectifier, and a plurality of direct current batteries, one battery being connected to the base and one battery being connected to the gate of the bi-directional silicon controlled rectifier, the switch means also including a plurality of conductors, means connecting one conductor to one of the batteries, and means connecting another conductor to the other battery.

3,886,377
CONTROL RECEIVER

Katsumi Taketa, and Kenji Takahashi, both of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 3, 1973, Ser. No. 385,243
Claims priority, application Japan, Aug. 9, 1972, 47-79655; Aug. 9, 1972, 47-79656
Int. Cl. H01h *47/20*
U.S. Cl. 307—129 **4 Claims**

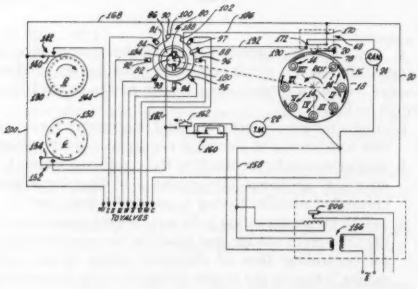


1. A control receiver comprising, in combination, a first electromagnetic coil responsive to a signal having a first predetermined frequency to provide an output voltage thereacross, a second electromagnetic coil responsive to a signal having a second predetermined frequency different from said first frequency to produce an output voltage thereacross, a load circuit to be controlled, switch means connected in said load circuit and having an open position to open said load circuit and connect said first coil to said load circuit, and a closed operating position to close said load circuit and connect said second coil to said load circuit, a switching circuit connected to said first coil and said second coil and rendered conductive by the output from that coil connected by said switch means to the load circuit, and means responsive to the conduction of said switching circuit to change said switch means from one to the other of the open and closed positions.

3,886,378
TIMING UNIT FOR CONNECTING POWER SEQUENTIALLY TO A PLURALITY OF STATIONS

Norman D. Morgan, Pasadena, Calif., assignor to Clemar Manufacturing Corporation, Glendora, Calif.

Filed Nov. 8, 1973, Ser. No. 413,886
Int. Cl. H01h *7/00*
U.S. Cl. 307—141.4 **23 Claims**



1. A timing unit for connecting power sequentially to each of a number of stations, comprising:

a frame;

a station timer rotationally mounted on said frame, said station timer being divided peripherally into sectors including a number of station sectors each corresponding to one of the stations;

a plurality of individually adjustable cam means each mounted on one of said station sectors, each said cam means dividing the peripheral length of the associated said station sector into first and second cam regions which are selectively variable in relative length;

drive means connected to said frame for rotating said station timer at a timing speed and at an advance speed relatively faster than said timing speed to move said sectors successively past a fixed datum on said frame;

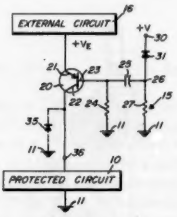
sensing means mounted on said frame for sensing said first and second cam regions as each said station sector passes said datum, said sensing means being connected with said drive means to cause rotation of said station timer at timing speed whenever on of said second cam regions is sensed by said sensing means and at advance speed whenever one of said first cam regions is sensed by said sensing means; and

selector means connected with said station timer and said sensing means for connecting power to each station while the corresponding one of said station sectors is passing said datum for the duration that said second cam region on said corresponding station sector is sensed by said sensing means.

3,886,379
RADIATION TRIGGERED DISCONNECT MEANS

Robert H. Bickley, Scottsdale, and Philip L. Clar, Mesa, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 13, 1972, Ser. No. 314,895
Int. Cl. H03k *17/00*
U.S. Cl. 307—202 **9 Claims**



1. Radiation triggered disconnect means for use with a circuit to be protected and a suitable power source for said circuit comprising:

a. a transistor having first, second and control electrodes;

b. means coupling the first and second electrodes of said transistor in a series circuit including the circuit to be protected and the power source for applying power from the power source to the circuit to be protected;

c. bias means connected to the control electrode of said transistor normally biasing said transistor in a saturation mode of operation;

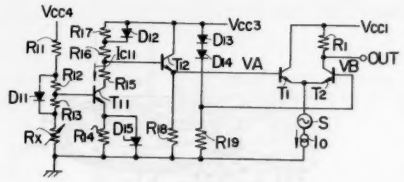
d. semiconductor junction means coupled to a power source in a normally reverse biased orientation and providing a flow of current in response to radiation impinging thereon, said semiconductor junction means being further coupled to the control electrode of said transistor for applying the flow of current to overcome the bias of said bias means and substantially cutoff conduction of said transistor; and

e. second semiconductor junction means coupled in parallel with the circuit to be protected in a normally reverse biased orientation and providing a discharge current path in parallel with the circuit in response to radiation impinging on said second semiconductor junction means.

3,886,380
GAIN CONTROL CIRCUIT

Norio Sobajima, and Kenichi Tonomura, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 11, 1974, Ser. No. 432,518
Claims priority, application Japan, Jan. 12, 1973, 48-5959
Int. Cl. H03k 17/00
U.S. Cl. 307—237 8 Claims

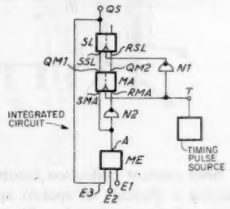


1. In a gain control circuit having a differential amplifier and a variable resistor coupled to an input thereof for controlling the output of said differential amplifier, said differential amplifier comprising emitter-coupled transistors, respective emitters of which are grounded through a signal source, the improvement comprising a transistor circuit, connected between said variable resistor and said input of said differential amplifier, having first and second transistors each having engaged emitter terminal, a base terminal, and a collector terminal, the base emitter terminals of said first transistor being connected to a base-emitter bias circuit including said variable resistor, the collector terminal of said first transistor being coupled to the base terminal of said second transistor, the emitter terminal of said second transistor being connected to said input of said differential amplifier and being grounded through a resistance, the collector terminal of said first transistor being connected to a collector voltage bias circuit containing a non-linear impedance, and the collector terminal of said second transistor being connected to a collector supply voltage.

3,886,381
ELECTRONIC STORAGE CIRCUIT FOR DIGITAL DATA PROCESSING DEVICES WITH HIGH FAULT SAFETY IN PARTICULAR FOR RAILROAD SAFETY SYSTEMS

Heinz-Juergen Lohmann, Braunschweig, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 266,549, June 27, 1972, abandoned.
This application Jan. 30, 1974, Ser. No. 437,912
Int. Cl. G11c 11/34; H03k 3/286
U.S. Cl. 307—238 3 Claims



1. An electronic storage circuit with high fault safety for digital data processing of binary switching variables in the form of rectangular signal voltages of a given repetition frequency, comprising:

an RS master flip-flop having a first input, a second input, a first output, and a second output,

an RS slave flip-flop having a third input connected to said first output, a fourth input connected to said second output, and a third output,

a first inverter,

a majority decision circuit having a fourth output connected to said second input and connected via said first inverter to said first input, and having fifth, sixth and seventh inputs, said fifth and sixth inputs receiving said rectangular signal voltages and said seventh input connected to said third output as a feedback input,

a second inverter,

a first timing input for said RS master flip-flop,

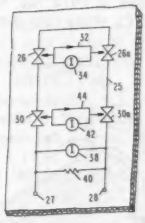
a second timing input for said RS slave flip-flop connected to said second inverter, and

means for applying a square wave timing signal to said first timing input and to said second inverter, said timing signal having twice the repetition frequency as said given frequency and the trailing edges of said timing signal coinciding with edges of said signal voltages.

3,886,382
BALANCED SUPERCONDUCTIVE TRANSMISSION LINE USING JOSEPHSON TUNNELLING DEVICES

Robert G. Cain, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1973, Ser. No. 428,974
Int. Cl. H03k 3/38, 17/00
U.S. Cl. 307—245 9 Claims



1. In a transmission line having a terminal at each end thereof across which the output is measured;

a plurality of pairs of Josephson tunnelling devices, each Josephson tunnelling device of a pair being located in the transmission line equally distant from opposite end terminals thereof to provide a balanced transmission line, each Josephson tunnelling device having a zero voltage and a finite voltage state;

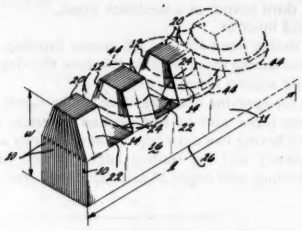
control means for simultaneously controlling the voltage switching point of each Josephson device of each pair of said Josephson tunnelling devices;

current means for providing electrical current through said transmission line and each of said Josephson tunnelling devices of each pair of devices causing any pair of Josephson tunnelling devices biased by said control means to simultaneously switch into its finite voltage state, thereby causing reflections in the transmission line in a balanced manner so that the transmission line stabilizing time is minimized.

3,886,383
COMPRESSED BACK IRON LINEAR MOTOR LAMINATED CORE

James A. Ross, La Jolla, and James A. Houdyshel, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Apr. 1, 1974, Ser. No. 456,620
Int. Cl. H02k *41/02*
U.S. Cl. 310—12 **14 Claims**



1. An improved laminated core for a linear induction motor employing windings comprising:

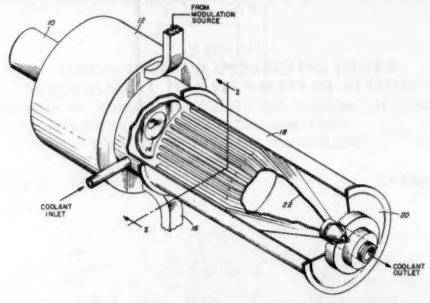
a plurality of interleaved laminations of different heights;

a top pole piece portion having an upper face and a bottom back iron portion with a rectilinear tapered transition therebetween, said face has a cross-sectional dimension less than the largest cross-sectional dimension of said back iron portion for concentrating the flux produced by the core.

3,886,384
COLLECTOR ELECTRODE

Raymond P. Tuinila, Beverly, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 4, 1974, Ser. No. 439,180
Int. Cl. H01j *1/00*; **H01k** *1/02*
U.S. Cl. 313—39 **2 Claims**



1. In an electron discharge device wherein a beam of electrons is directed toward a collector electrode, an improved collector electrode comprising a hollow substantially cylindrical portion and a hollow conical portion covering one end of such cylindrical portion, both such portions being laminated and consisting of a core layer of a material selected from the group of stainless steel, beryllium, copper and titanium between an inner and an outer layer of oxygen-free high conductivity copper.

3,886,385
RATE OF MOTION DETECTOR

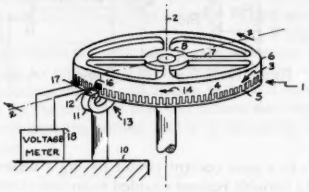
Francesco L. Bacchialoni, 9 Claremont Ave., Arlington, Mass. 02175

Filed Nov. 15, 1972, Ser. No. 306,706
Int. Cl. H02k *21/32*
U.S. Cl. 310—152 **13 Claims**

1. Apparatus for detecting the rate of motion of one body relative to another body comprising in combination,

means supported by one of said bodies for producing a substantially steady magnetic field, at a given area which is fixed relative to said supporting body,

a set of electrical conductors fixed to the other of said bodies including a relatively long electrical conductor which is continuous from one end to the other end thereof and a plurality of relatively short electrical conductors, the short conductors being disposed side by side and each electrically connected at one end only to the long conductor at spaced points therealong,



the orientation of he set on said other body being such that the short conductors enter and leave said magnetic field area one after another at a rate proportional to the said relative rate of motion, and

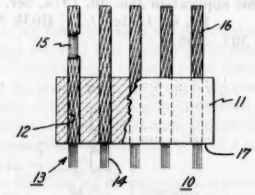
an electrical contact for contacting the other end of at least one of the short conductors at a time while said contacted short conductor is in the magnetic field,

whereby a signal is produced between the contact and the long conductor, said signal being representative of the said rate.

3,886,386
CARBON FIBER CURRENT COLLECTION BRUSH

William B. Hillig, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1973, Ser. No. 384,590
Int. Cl. H02k *13/00*
U.S. Cl. 310—251 **2 Claims**

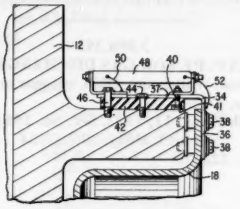


1. A carbon fiber current collection brush comprising a carbon body having a plurality of spaced apertures therethrough, a plurality of elongated carbon fibers positioned in each of the apertures and extending outwardly therefrom in both opposite directions, a flexible braided metallic sheath covering the portion of the fibers within each of the apertures and the portion of the fibers extending outwardly in one direction, and the fibers extending outwardly in the other direction being exposed and being generally of uniform length from the edge of the carbon body.

3,886,387
FLUX SHIELD FOR DYNAMOELECTRIC MACHINES

Peter H. Graham, Schenectady, and Paul Reece, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 384,310, July 31, 1973. This application Dec. 26, 1973, Ser. No. 427,627
Int. Cl. H02k 1/12
U.S. Cl. 310—256 5 Claims

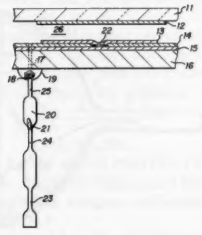


1. In a dynamoelectric machine of the type including a stator core comprising a plurality of laminations held in assembled relation by a number of circumferentially spaced, axially extending keybars secured at each opposite end to a respective end flange; an improved flux shield assembly at each end of the dynamoelectric machine, wherein the improvement comprises:
   a. a non-magnetic, annular flux shield of high electrical conductivity spaced from but adjacent to a respective end flange on a side further removed from the stator core;
   b. fastening means securing each flux shield to its respective end flange; and,
   c. means in combination with said fastening means for electrically insulating each flux shield from its respective end flange.

3,886,388
ALUMINUM RETENTION MAZE AND GETTER

Rigaud B. Paine, Jr., Dallas, and Michael Peshock, Jr., Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 10, 1974, Ser. No. 459,819
Int. Cl. H01j 61/26
U.S. Cl. 313—177 10 Claims

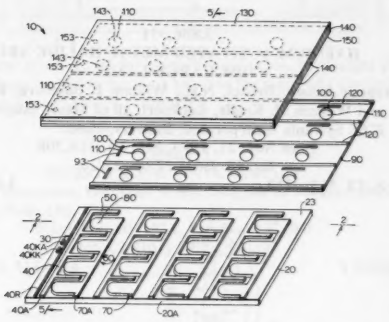


1. In a gas discharge display panel where a display gas with mercury atmosphere is retained in a chamber between display control electrodes, the combination which comprises an aluminum body in surface communication with the atmosphere in said chamber for interacting with said mercury and forming a product to serve as a getter for O_2 and H_2O which evolve during energization of said display.

3,886,389
DISPLAY PANEL

James A. Ogle, Neshanic Station, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 26, 1973, Ser. No. 428,415
Int. Cl. H01j 61/06
U.S. Cl. 313—188 25 Claims

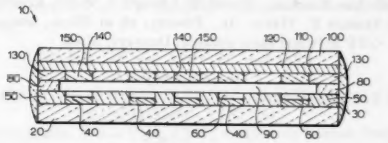


14. A display panel comprising
a gas-filled housing,
a plurality of electrode pairs supported on a surface in said housing and oriented in rows and columns,
said electrodes being operable as cathode electrodes, and
an anode electrode in operative relation with each of said cathode electrode pairs,
said anode being operable with each member of a pair separately to comprise separate ionizable gas cells.

3,886,390
BUTTABLE, GASEOUS DISCHARGE, DISPLAY PANEL INCLUDING ELECTRODES PROVIDING A DOT MATRIX DISPLAY

Thomas C. Maloney, Bernardsville, N.J.; Rudolph A. Cola, Malvern, Pa., and Ronald O. Wescott, Edison, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 29, 1974, Ser. No. 501,836
Int. Cl. H01j 61/06, 61/42
U.S. Cl. 313—217 5 Claims



1. A display panel comprising
a gas-filled envelope including
a base plate and face plate hermetically sealed together,
a plurality of vertical conductive strips positioned on the top surface of said base plate,
a first layer of insulating material covering said conductive strips and including first apertures disposed in series along each of said conductive strips, each first aperture exposing a dot-like portion of the associated strip which is operable as a cathode electrode, said dot-like cathode electrodes being arrayed in rows and columns,
a second layer of insulated material on said first layer and having a plurality of horizontal slots, each aligned with a row of said cathode electrodes,
a plurality of horizontal strips of transparent conductive material on the inner surface of said face plate, each such

strip overlaying one of said horizontal slots in said second layer, and

an opaque conductive layer on each of said horizontal strips and having a series of second apertures therein,

each second aperture exposing a dot-like area of its horizontal strip which is operable as an anode electrode, each such anode electrode being vertically aligned with and in operative relation with one of said cathode electrodes.

3,886,391

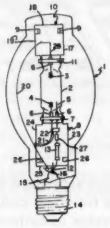
HAFNIUM ACTIVATED METAL HALIDE ARC DISCHARGE LAMP

Frederic Koury, Bristol, N.H.; William I. Bamberg, Boston, and William M. Keeffe, Rockport, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 21, 1973, Ser. No. 418,208

Int. Cl. H01j *17/06, 17/20*

U.S. Cl. 313—218 **3 Claims**



1. A high intensity metal halide arc discharge lamp comprising: an arc tube having sealed ends and containing a fill including mercury and a metal halide; and hafnium activated electrodes disposed within said arc tube, the size of said electrodes being such that during normal operation of the lamp the rate of evaporation of hafnium from said electrodes is about equal to the rate of deposition of hafnium from hafnium halide thereon, thereby ensuring hafnium activation of said electrodes throughout normal lamp life, and wherein the construction of said electrodes is such that their hot spot temperature during normal lamp operation is between about 1825°C and 2325°C.

3,886,392

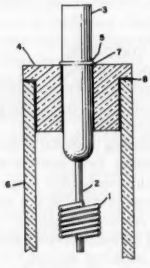
METHOD OF SEALING ALUMINA ARC TUBE

Nikolaos Barakitis, Haverhill; Edward A. Webb, Reading, and Francis B. Makar, Jr., Beverly, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Feb. 25, 1974, Ser. No. 445,063

Int. Cl. H01j *6/36*

U.S. Cl. 313—220 **1 Claim**



1. An arc tube for a high pressure sodium lamp comprising: an alumina arc tube having a cylindrical alumina plug sealed at each end thereof, each plug having a large and a small diameter section, the small diameter section being inserted into the arc tube and the large diameter being outside the arc tube, the capillary space between the small diameter section and the inner wall of the arc tube being filled with a sealing glass, the capillary space between the large diameter section and the end of the arc tube being filled with a sealing glass, a niobium tube, having a raised peripheral seating ring intermediate its ends, extending through said plug so that said ring is in contact with the outer surface of said plug, said niobium tube being sealed to said plug from said seating ring along the entire length of said plug by a sealing glass, and an electrode disposed on the inner end of said niobium tube.

3,886,393

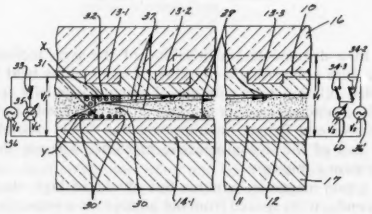
GAS MIXTURE FOR GAS DISCHARGE DEVICE

David C. Hinson, Whitehouse, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 11, 1972, Ser. No. 279,875

Int. Cl. H01j *7/06, 11/04*

U.S. Cl. 313—223 **5 Claims**



1. In an article of manufacture comprising an AC multiple gas discharge phosphor display device containing an ionizable gaseous medium, the improvement wherein the gaseous medium consists essentially of 20 to 35 percent atoms of argon and 80 to 65 percent atoms of a xenon-based composition, whereby the peak gas discharge currents are decreased and the mean memory margin is increased.

3,886,394

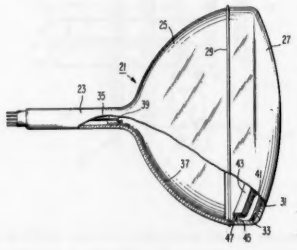
IMAGE DISPLAY EMPLOYING FILTER COATED PHOSPHOR PARTICLES

Steven Alan Lipp, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,094

Int. Cl. H01j *29/18*

U.S. Cl. 313—470 **10 Claims**



1. An image display comprising a luminescent viewing screen and means for selectively exciting areas of said screen to luminescence, said screen comprising a layer of phosphor particles emissive of light in a particular portion of the visible spectrum, said phosphor particles having adhered to their surfaces color filter particles which are transmissive of light in said portion of the visible spectrum, said color filter particles

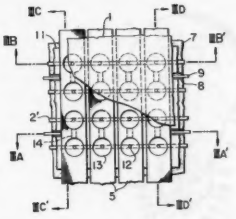
covering between 20 and 80 percent of the surfaces of said phosphor particles.

3,886,395

FLAT, GASEOUS DISCHARGE, PHOSPHOR DISPLAY PANEL WITH OFFSET SUBSIDIARY ELECTRODES

Masakazu Eukushima; Seiichi Murayama, both of Kukubunji; Tsuyoshi Seko, Musashimurayama, and Shinichi Shinada, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 29, 1974, Ser. No. 492,730
Claims priority, application Japan, July 27, 1973, 48-84136
Int. Cl. H01j *61/42, 61/54*
U.S. Cl. 313—484 **7 Claims**



1. A flat display panel comprising
a. an insulating substrate provided with a plurality of slots formed in parallel with each other and spaced apart from each other by a predetermined distance, said slots defining subsidiary discharge spaces,
b. a plurality of first electrodes each of which is disposed in each of said plurality of slots, respectively,
c. a plurality of second electrodes disposed upon said insulating substrate adjacent to said slots,
d. a plurality of third electrodes spaced apart from said second electrodes by a predetermined distance, said third electrodes intersecting said second electrodes at predetermined angles, a through hole being formed through said third electrodes at each point at which said third electrodes intersect said second electrodes, the main discharges occurring between said third and second electrodes while the subsidiary discharges occur between said third and first electrodes,
e. a phosphor material disposed within each of the through holes of said third electrodes,
f. a transparent insulating substrate disposed in contact with said third electrodes for hermetically sealing a discharge gas or discharge gas mixture filled into said slots of said insulating substrate and into said through holes of said third electrodes, and
g. each group consisting of at least two of said through holes which are formed in the same third electrode being hydraulically communicated with each other and with one of said slots of said insulating substrate.

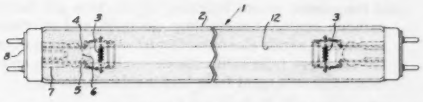
3,886,396

FLUORESCENT LAMP WITH PROTECTIVE COATING

Edward E. Hammer, Mayfield Village, and Edward E. Kaduk, Lyndhurst, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 188,096, Oct. 10, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 397,913
Int. Cl. H01j *61/42*
U.S. Cl. 313—486 **5 Claims**

1. A fluorescent lamp comprising an elongated vitreous tube containing an ionizable medium including mercury vapor and having electrodes sealed into its ends, a coating of phosphor on a major portion of the inside surface of said tube, and a postcoat of finely divided aluminum oxide of submicron size forming a porous discontinuous coating on the particles of said phosphor layer to improve maintenance and reduce end discloration, the quantity of aluminum oxide in said postcoat being but a small fraction of the quantity required to achieve



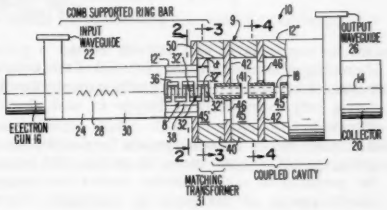
complete coverage of the phosphor particles, the weight of said aluminum oxide postcoat being in the range of 10 to 160 micrograms per square centimeter.

3,886,397

HYBRID SLOW WAVE CIRCUIT

Yukio Hiramatsu, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 10, 1974, Ser. No. 432,380
Int. Cl. H01j *23/24, 25/34*
U.S. Cl. 315—3.6 **1 Claim**



1. A device for progressively interacting microwave energy with an electron beam comprising:
a. means for projecting a beam of electrons over an elongted beam path;
b. a ring and bar slow wave circuit disposed along said beam path in enegy exchange relationship with said beam;
c. a coupled cavity slow wave circuit disposed along said beam path downstream of said ring and bar circuit and in energy exchange relationship with said beam;
d. said ring and bar circuit being in direct microwave energy exchange relationship with said coupled cavity circuit by protruding into a first cavity of said coupled cavity circuit.

3,886,398

ELECTRON BEAM ELECTRICAL POWER TRANSMISSION SYSTEM

Joseph Feinstein, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

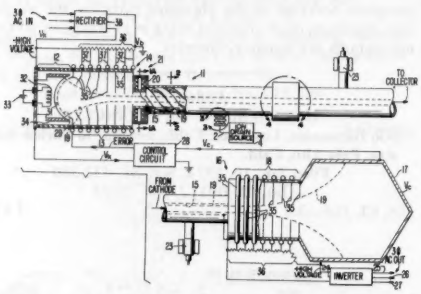
Filed Aug. 20, 1973, Ser. No. 389,913
Int. Cl. H01j *25/02*
U.S. Cl. 315—5 **7 Claims**

1. In an electron beam power transmission system for transmitting electrical power from a transmitting location to a remote receiving location:
elongated evacuated envelope means extending from the transmitting location to the receiving location, said receiving location being geographically removed from the transmitting location;
transmitter means at said transmitting location for accelerating and projecting a beam of electrons through said evacuated envelope means from said transmitting location to said receiving location;
receiver means at said receiving location for converting kinetic energy of the beam to electrical power for application to a power load, said receiver means comprising

collector means for collecting the electrons as conduction current;

electrical conductor means interconnecting said receiver means and said transmitter means for returning said conduction current to said transmitter means;

said transmitter means including an electron gun having a cathode emitter for emitting electrons and an electron permeable anode electrode for drawing a stream of emitted electrons from said cathode emitter to form an electron beam emergent from said anode electrode;



means for supplying to said cathode emitter a potential alternating with respect to the potential of said conductor means for causing said gun to produce an electron beam during only every other half-cycle of said alternating potential;

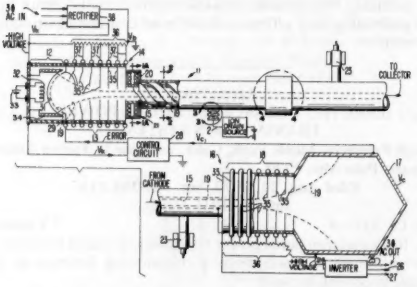
said receiver means including means for developing a potential on said collector means alternating with respect to the potential of said conductor means for converting kinetic energy of the beam to alternating electrical power.

3,886,399

ELECTRON BEAM ELECTRICAL POWER TRANSMISSION SYSTEM

Robert Spencer Symons, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Aug. 20, 1973, Ser. No. 389,914
Int. Cl. H01j *25/02*
U.S. Cl. 315—5 **37 Claims**



1. In an electron beam power transmission system for transmitting electrical power from a transmitting location to a receiving location remote from the transmitting location:

elongated evacuated envelope means extending from the transmitting location to a geographically removed receiving location;

transmitter means at the transmitting location for forming, accelerating and projecting a beam of electrons over an elongated beam path extending within and along said evacuated envelope from the transmitting location to the receiving location; and

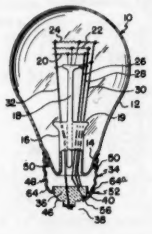
receiver means at the receiving location for converting kinetic energy of the beam to electrical power for application to a power load, comprising, means for decelerating the electrons by an electric field component in the direction of their motion and means for collecting the decelerated electrons as conduction current.

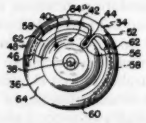
3,886,400

MULTI-FILAMENT LIGHT BULB AND THE LIKE

Gary G. Dill, 28392 Magnolia Dr., North Olmsted, Ohio 44070

Filed May 11, 1973, Ser. No. 359,609
Int. Cl. H01k *1/44, 1/64*
U.S. Cl. 315—64 **13 Claims**





1. In a multi-filament electric light bulb having a sealed glass envelope and a base fixedly attached thereto, said base being adapted for engaging in a receiving socket, and including a plurality of conducting elements arranged in parallel and connected to a respective filament, said base comprising a hollow electrical conducting member and an insulating member disposed in the lower end of said hollow member and projecting outwardly of said lower end thereof, a plurality of spaced stationary contacts mounted generally circumferentially on said insulating member and being exteriorly accessible, each of said contacts being electrically coupled to a respective one of said conducting elements, an electrical conducting selector having free ends and being movably mounted on said base, for generally circumferential movement with respect thereto, said selector at its ends extending interiorly of said base for movably mounting said selector on said base, said selector having a contact portion adapted for engagement with a respective one of said stationary contacts to electrically couple said hollow member to a selected one of said conducting elements, said selector being positioned relative to said base so that said contact portion extends below said hollow member and generally hugs the exterior surface of said base.

3,886,401

APPARATUS FOR ACCELERATING CATHODE HEATING

Peter G. Berg, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 1, 1974, Ser. No. 484,539
Int. Cl. H05b *39/00*
U.S. Cl. 315—94 **4 Claims**

1. Apparatus for accelerating the heating of the cathode heater of a cathode ray tube or the like comprising:

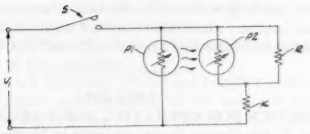
a first self-heating positive temperature coefficient resistor having a relatively low initial resistance which increases abruptly as its temperature rises above a given level;

means for interconnecting said resistor to an electrical power source thereby rapidly to heat it above said given level;

a second self-heating positive temperature coefficient resistor positioned in heat-exchange relationship with said first resistor and having a relatively low initial resistance which increases abruptly as its temperature rises above a given level;

a resistor of substantially fixed resistance shuntconnected with said second self-heating resistor; and

means for interconnecting said shunt-connected resistors in series with the heater of said cathode across an electrical power source adapted to supply power of a substantially constant potential in excess of that required to maintain



the heater of said cathode at a predetermined temperature;

the resistance of the second self-heating resistor being not substantially more than that of the fixed resistor at temperatures below its aforesaid given level but substantially greater than that of the fixed resistor at temperatures above its aforesaid given level, whereby after power is initially supplied to the cathode heater its potential will be reduced from a level substantially in excess of that required to maintain the heater at said predetermined temperature to a level which maintains the heater at substantially said predetermined temperature as the first and second resistors self-heat thereby to increase and then maintain said second resistor at a temperature above its aforesaid given level.

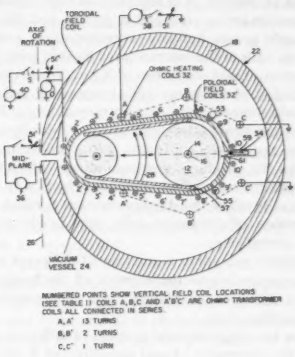
3,886,402
MAGNETIC PUMPING IN SPATIALLY INHOMOGENEOUS MAGNETIC FIELDS

Harold P. Furth, and Robert A. Ellis, Jr., both of Princeton, N.J., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 7, 1974, Ser. No. 467,685
Int. Cl. G21b *13/04*
U.S. Cl. 315—111.7 **9 Claims**

1. Apparatus for heating a toroidally extending plasma column in an ATC having poloidal and toroidal coil means and toroidal containment means, comprising:

a. means for producing a magnetic field having spaced apart regions of stability and an unstable region therebetween for providing unbalanced biasing forces on the plasma column along the radial axes of the containment means for alternately, periodically and oppositely displacing the plasma column radially back and forth between the regions of stability in the plane of the containment means within a time period t_i of an average ion-ion collision


TOROIDAL FIELD COIL
AXIS OF ROTATION
OHMIC HEATING COILS 32
POLOIDAL FIELD COILS 32'
MID-PLANE
VACUUM VESSEL 24
NUMBERED POINTS SHOW VERTICAL FIELD COIL LOCATIONS (SEE TABLE I) COILS A,B,C AND A'B'C' ARE OHMIC TRANSFORMER COILS ALL CONNECTED IN SERIES.
A, A' 13 TURNS
B, B' 2 TURNS
C, C' 1 TURN

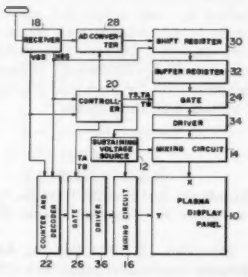
time; and

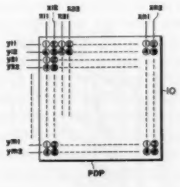
b. means for modulating said poloidal coil means.

3,886,403
BRIGHTNESS MODULATION SYSTEM FOR A PLASMA DISPLAY DEVICE

Kenichi Owaki, Kobe; Shozo Umeda, Kakogawa; Hiroshi Furuta, Akashi; Tadatsugu Hirose, Akashi, and Michihiro Shimuzi, Akashi, all of Japan, assignors to Fujitsu Limited, Japan

Filed Dec. 29, 1972, Ser. No. 319,941
Claims priority, application Japan, Dec. 30, 1971, 47-1464
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 R **11 Claims**





1. A brightness modulation system for producing an image display with selectively controlled brightness level gradations on a plasma display device, said plasma display device having

a plurality of X electrodes and a plurality of Y electrodes disposed to intersect each other with a discharge gas spaced therebetween whereby a plurality of discharge cells is formed at the intersections of the X and Y electrodes, the successive, adjacent electrodes of at least one of said pluralities of X and Y electrodes being arranged in groups and the electrodes of each such group defining corresponding combinations of discharge cells at the intersections thereof with the electrodes of the other of said pluralities of X and Y electrodes, each said combination of discharge cells comprising a display element of the said image display, the corresponding cells of each said combination being selectively and individually controllable to undergo respective, different and predetermined rates of discharge to produce corresponding, different individual brightness levels thereby to provide selective gradations of the brightness level of the display element formed by each such combination of discharge cells, said brightness modulation system comprising:

means for providing a number of different sustain signals corresponding to the number of discharge cells in each said combination thereof and of respectively different repetition rates,

means for supplying said number of different sustain signals to the electrodes of said pluralities of X and Y electrodes corresponding to each said combination of discharge cells, thereby to sustain predetermined, different rates of discharges in the respectively corresponding cells of said combinations of cells,

means for indicating the brightness level gradation to be displayed in each display element of the image display.

means responsive to said indicating means for selecting the cells of the combination thereof corresponding to each display element which, in combination, provide the brightness level gradation for that corresponding display element as indicated by said indicating means,

means for selectively establishing discharges in the cells selected by said selecting means of each said combination thereof, and

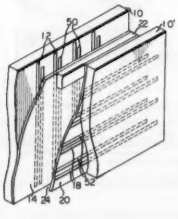
said sustaining means sustaining discharges in those cells of each said combination in which discharges are selectively established by said means for selectively establishing discharges in accordance with the said predetermined different rates of discharges sustained by the respective, different sustain signals, thereby to sustain the gradation of brightness level for each said display element as indicated by said indicating means.

3,886,404

PLASMA DISPLAY

Koichiro Kurahashi, and Hiroshi Tottorik, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 22, 1974, Ser. No. 444,733
Claims priority, application Japan, Feb. 27, 1973, 48-23475
Int. Cl. N05b *41/00*
U.S. Cl. 315—169 TV **6 Claims**



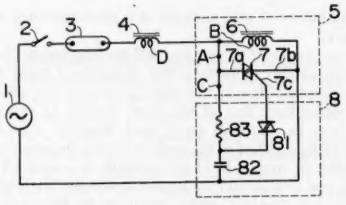
1. A plasma display device comprising, in combination, a first plane, an array of first main electrodes in the form of longitudinally elongated strips disposed in substantially parallel relationships in said first plane, an array of first auxiliary electrodes disposed in said first plane so that each of said first auxiliary electrodes runs in substantially parallel relationship with and adjacent to a different one of said first main electrodes, a second plane disposed in spaced parallel relationship with said first plane to form a discharge gap therebetween, an array of second main electrodes in the form of longitudinally elongated strips disposed in substantially parallel relationship in said second plane to be at a predetermined angle to said array of first main electrodes, an array of second auxiliary electrodes disposed in said second plane so that each of said second auxiliary electrodes runs in substantially parallel relationship with and adjacent to a different one of said second main electrodes, first circuit means for selectively applying a first voltage pulse to the main electrodes of each of said arrays of main electrodes to initiate and terminate an electric discharge thereacross, and second circuit means for successively applying second voltage pulses to said arrays of first and second auxiliary electrodes so as to develope a pulse train including pulses of one polarity alternating pulses of opposite polarity thereacross whereby said electric discharge is followed by electric discharges intermittently caused across those first and second auxiliary electrodes disposed adjacent to the first and second main electrodes applied with said first voltage pulses.

3,886,405

DEVICE FOR OPERATING DISCHARGE LAMPS

Mitsuo Kubo, Osaka, Japan, assignor to Mamiya Koki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 1, 1973, Ser. No. 328,654
Claims priority, application Japan, Feb. 7, 1972, 47-13416; Feb. 7, 1972, 47-13417; Mar. 1, 1972, 47-20562
Int. Cl. H05b *41/16*
U.S. Cl. 315—246 **15 Claims**

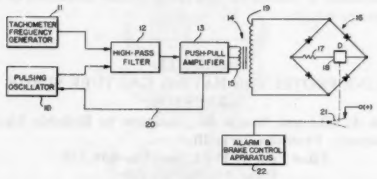


1. A device for operating a discharge lamp comprising: an alternating current power source; a discharge lamp having a rated current value; a low impedance element, said low impedance element being a coil with a relatively few number of turns and relatively small in size; current limiting means comprised of high impedance means and bi-directional means coupled in parallel with said high impedance means for limiting electric current flowing in said discharge lamp to a value below the rated value thereof during a first portion in each half cycle of the alternating current of said power source, said current limiting means being inoperative during the remaining portion of each half cycle and being switched from operative to inoperative states by a control signal, said low impedance element and said current limiting means being connected between said alternating current power source and said discharge lamp; and control signal generating means connected to said current limiting means for applying a control signal to said current limiting means at a predetermined current control changeover point during each half cycle, said predetermined current control changeover point occurring at substantially 90° with respect to current cross-over of each half cycle, whereby said current limiting means become inoperative after the control signal is applied to said current limiting means during each half cycle and the electric current flowing in said discharge lamp increases so that an effective current has said rated value for the half cycle.

3,886,406
OVERSPEED CONTROL SYSTEM FOR A VEHICLE

Robert F. Anderson, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,551
Int. Cl. H01h *47/02*
U.S. Cl. 317—5 **4 Claims**



1. An overspeed control system for a vehicle having a detector relay controlled by outputs of an oscillator and a tachometer frequency generator through a high-pass filter and amplifier wherein the improvement comprises;

a. a step-up transformer having a primary winding energized by output of the amplifier,

b. control means including a full-wave rectifier connected across a resistor and a winding of the detector relay in series for energizing the detector relay by output of an independent secondary winding of the step-up transformer,

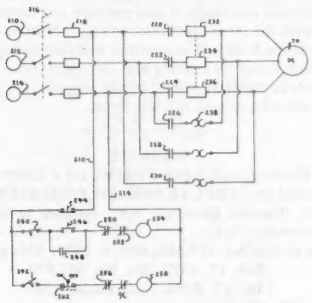
c. the resistor having a resistance value several times the resistance of the detector relay winding,

d. whereby the detector relay is quick to respond to de-energization since the shunting effect of the full-wave rectifier is reduced by the series resistor that serves to isolate the relay winding from the rectifier.

3,886,407
REFUSE COMPACTOR SYSTEM

Lester Hans Anderson, 385 Cottage Ave., Glen Ellyn, Ill. 60137

Filed June 21, 1973, Ser. No. 372,252
Int. Cl. H02h *4/085*
U.S. Cl. 317—13 R **3 Claims**



1. A control circuit for a compactor drive motor provided with forward and reverse power circuits, for a cycle operation, comprising:

contactor switch means in said forward and reverse power circuits;

an adjustable current sensitive relay means in said forward power circuit;

a line of said control circuit having a mechanically operable normally closed switch means when said motor is in its forward and rearward drive cycle, and open when said motor has completed its forward drive cycle, and contactor coil means for operating said contactor switch means in said forward power circuit;

another line of said control circuit having a mechanically operable normally closed switch means when said motor is in its forward and reverse drive cycle, and open when said motor has completed its reverse cycle, and contactor coil means for operating said contactor switch means in said reverse power circuit;

said line of said first contactor coil means having a normally closed (contact) switch means operable by said second contactor coil means, and the line of said second contactor coil means having a normally closed (contact) switch means operable by said first contactor coil means;

a second normally closed switch means in said first (mentioned) line operable to open by said current sensitive relay means in said power circuit for forward drive (; and) to abort said forward drive cycle and initiate said reverse drive cycle to completion;

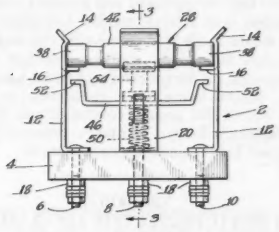
said normally closed switch means in said line of first contactor coil means operable to open by said second contactor coil means when said mechanically operable switch means in said another line is closed and said first mentioned mechanically operable switch means is opened; and

manually operable switch means in said (lines) line of said (first and) second contactor coil means(.) operable to open during said forward drive to stop said motor at its maximum forward drive.

3,886,408
LINE PROTECTOR

Milton A. Klayum, Itasca, and Richard E. Nelson, Arlington Heights, both of Ill., assignors to Reliable Electric Company, Franklin Park, Ill.

Filed Nov. 19, 1973, Ser. No. 417,064
Int. Cl. H02h *3/20*
U.S. Cl. 317—16 **10 Claims**



1. A mounting for a gas tube having three electrodes which are electrically insulated from each other and wherein there is an arc gap within the tube between each of first and second electrodes and a third electrode, said mounting including three terminals electrically insulated from each other, means for removably supporting said gas tube with said three electrodes in electrical contact with each of said terminals respectively, contactor means, resilient means urging said contactor means from a normal location out of electrical contact with the terminals associated with said first and second electrodes to a location of electrical contact with said three terminals, and mechanism preventing said electrical contact of the contactor means with said terminals associated with said first and second electrodes except upon overheating of said gas tube; said mechanism comprising meltable means in the form of a film for heat reception from said gas tube, and cooperating relatively slidable parts rigidly held in fixed positions by said meltable means between said cooperating parts except upon said overheating but relatively slidable upon melting of said meltable means due to said overheating, said parts being

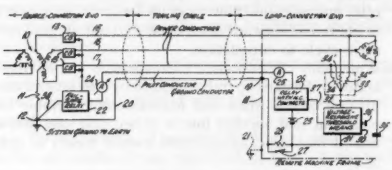
repositionable upon solidification of said meltable means and without replacement thereof to reset said contactor means in its normal location, and at least one of said parts being in force-transmitting engagement with said resilient means and imposing a shear force on said meltable means.

3,886,409

MEANS FOR MONITORING THE SAFETY OF A REMOTE ELECTRICAL GROUND CONNECTION

Leopoldo Scarpino, Indianapolis, Ind., assignor to AMAX Inc., New York, N.Y.

Filed May 9, 1973, Ser. No. 358,468
Int. Cl. H02h *3/16*
U.S. Cl. 317—18 C **21 Claims**



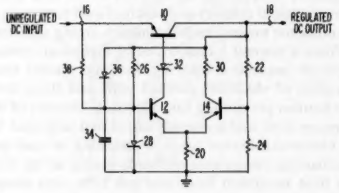
1. Elongate transmission-line means having a source-connection end and a remote load-connection end and comprising power-conductor means, a ground conductor and a pilot conductor; a d-c conducting connection of said power-conductor means to said ground and pilot conductors at the source-connection end; a d-c conducting connection to said power-conductor means at the load-connection end; whereby relatively constant resistance values characterize the d-c conducting paths from the respective load-connection ends of said power-conductor means and of said pilot-conductor means, to said d-c conducting connection at the source-connection end; means for impressing a d-c potential across the full length of said ground conductor, said last-mentioned means including a d-c source in one of said paths and a circuit connection of said one path and said ground conductor at the load-connection ends thereof; and d-c responsive resistance-monitoring means at the load-connection end and including a reference connection to the source-connection end of said ground conductor via the other of said paths, said resistance-monitoring means being also connected to the load-connection end of said ground conductor and thus tracking the instantaneous effective resistance between the source-connection and load-connection ends thereof.

3,886,410

SHORT CIRCUIT PROTECTION APPARATUS FOR A REGULATED POWER SUPPLY

Harold George Seer, Jr., Woodbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 21, 1973, Ser. No. 427,346
Int. Cl. H02h *3/24*
U.S. Cl. 317—31 **9 Claims**



1. In a regulated power supply of the type in which a pair of transistors are arranged in a differential amplifier configuration to compare a substantially constant voltage with a voltage derived at an output terminal of said supply, in providing control signals to a third transistor in a direction to stabilize said output voltage at a predetermined level, the combination therewith of:

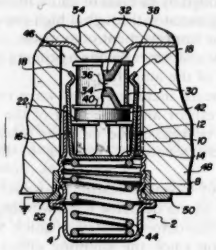
means including a semi-conductor rectifier coupled between said output terminal and one of said pair of transistors to control it to render said third transistor non-conductive when the voltage provided at said output terminal is indicative of a short circuit condition of said power supply.

3,886,411

LINE PROTECTOR HAVING GAS TUBE SURGE ARRESTOR

Milton A. Klayum, Itasca, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Feb. 4, 1974, Ser. No. 439,348
Int. Cl. H02h *9/06*
U.S. Cl. 317—62 **9 Claims**



1. A line protector comprising means forming a circuit that is adapted to be connected between a line and ground to provide overvoltage protection for the line, said circuit comprising, in series, spaced electrodes forming an arc gap and being part of a gas tube, a shunt having means forming an electrical contact with only one of said electrodes, and a tubular cap that telescopically and conductively receives said shunt coaxially therein; a spring in said cap and imposing axial pressure on said shunt in the direction of said gas tube, said shunt having fingers projecting in an axial direction from one end of said cap, said fingers having extremities axially between said electrodes exteriorly of said gas tube and normally out of contact with the other electrode, and said shunt having ledges axially intermediate said extremities and said spring and comprising said means for forming said electrical contact with said one electrode, said last-named means also providing a support for said gas tube at said one electrode.

3,886,412

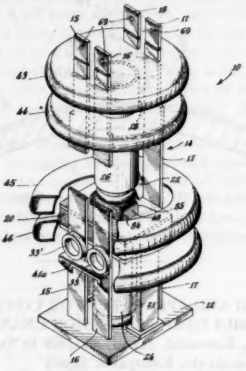
FLEXIBLE SNAKE-LIKE STRING OF COMPONENTS ENCASED IN TUBULAR SHEATH IMMERSED IN OIL

Stanley G. Peschel, Brewster, N.Y., assignor to Hipotronics, Inc., Brewster, N.Y.

Division of Ser. No. 187,688, Oct. 8, 1971. This application Nov. 17, 1972, Ser. No. 307,571
Int. Cl. H05k *5/00*; **H02m** *5/00*
U.S. Cl. 317—99 **5 Claims**

1. A flexible snake-like string for electrically coupling a high voltage terminal with a low voltage terminal comprising a long flexible tubular sheath of high voltage stress resistant plastic having a long tubular bore, a multiplicity of cylindrical electrical cartridge components all of the same size positioned within the bore of said sheath in end-to-end relationship with the ends of successive cartridge components positioned closely adjacent to one another, the ends of successive cartridge components in said bore being flexibly electrically connected for interconnecting all of the cartridge components in series electrical relationship within said long tubular bore while

permitting flexing of said tubular sheath, the diameter of said cartridge components being substantially equal to the internal diameter of said bore, and said tubular sheath containing said series-connected cartridge components being immersed in transformer oil, and said tubular sheath having a lower dielectric constant than said transformer oil but having a higher dielectric strength than said transformer oil, whereby an increased voltage gradient appears across said plastic sheath as compared to said transformer oil, thereby reducing the voltage stress in the transformer oil for protecting the oil from electrical breakdown.

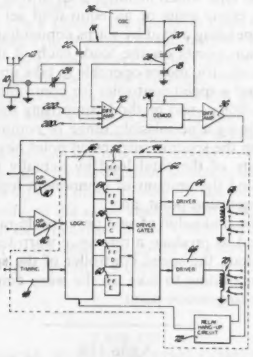


3,886,413

PRESENCE SENSING AND SELF-CHECKING CONTROL SYSTEM

Frederick J. T. Dow, Wolfeboro Falls, N.H., and Dudley B. Hartung, Somerville, Mass., assignors to Xenex Corporation, Woburn, Mass.

Filed Jan. 29, 1973, Ser. No. 327,384
Int. Cl. H01h *47/00*
U.S. Cl. 317—123 **14 Claims**



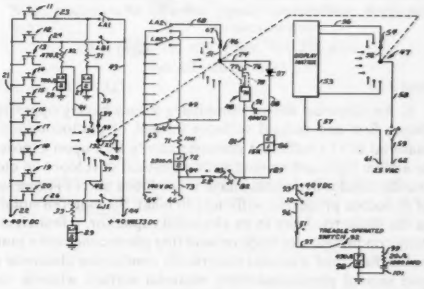
1. A presence detection system of the type comprising sensing means including a sensing element adapted to be disposed adjacent a zone to be monitored and including electrical signal producing means connected with said element, said sensing means having an output adapted to produce a reference signal when said zone is in a normal condition and an intrusion signal when an object intrudes into said zone, and control means having an input connected with the output of said sensing means, said control means including a control circuit and a controller connected thereto, said control circuit being responsive to an intrusion signal to cause actuation of said controller and responsive to a reference signal to cause deactuation thereof, the improvement comprising; self-checking means including timing means, command signal means cyclically operated by the timing means and connected with an input of said control circuit for periodically applying a simulated intrusion signal thereto, said self-checking means also including a logic means having an input connected with a selected point of the control circuit to determine whether a simulated intrusion signal applied to the control circuit is operative to produce a predetermined signal at the selected point in the control circuit during the occurrence of a simulated intrusion signal, said logic means including a self-check bistable element which assumes one state in response to said simulated intrusion signal, gate means having one input connected with the output of the self-check bistable element and having another input connected with a point in said self-checking means having a logic level voltage state indicative of what said one state should be in the absence of a malfunction, said gate means being connected with said controller and being adapted to cause actuation thereof when the bistable element assumes another state in response to said simulated intrusion signal.

3,886,414

DISPATCHING SYSTEM CIRCUIT

Ronald Louis Lach, Arlington Heights, and William Jean Brier, Skokie, both of Ill., assignors to Elec-Tro-Tec, Inc., Elk Grove Village, Ill.

Filed Apr. 10, 1974, Ser. No. 459,549
Int. Cl. H01h *47/00*; **G08g** *1/00*
U.S. Cl. 317—137 **4 Claims**



1. For use in a dispatching system circuit having: a plurality of actuating means each at an associated serving station for producing electrical request signals; a plurality of latching relays each in circuit with an associated one of the actuating means for actuation in response to a request signal produced by the latter; a plurality of instructing means each associated with one of the serving stations, each of the instructing means being operated in response to actuation of an associated latching relay; control switch means for initiating operation of the instructing means; a stepping relay in a circuit for energization thereof and a three group set of stepping switches stepping in unison in response to energization of the stepping relay, each group having plural relay outlet terminals each associated with one of the latching relays; the first group being in a circuit with the stepping relay and the latching relays for controlling the positioning of the set, actuation of each latching relay serving to interrupt the stepping relay circuit for de-energization thereof at a predetermined position; the second group being in circuit with the instructing means for selective energization thereof in accordance with the positioning of the set; the third group being in circuit with the latching relays and being operable to return the latter to their un-actuated positions; the combination comprising: first relay means in a circuit with all of the latching relays to be operated in response to actuation

of any of the latter, operation of said first relay means serving to complete an energizing circuit for the stepping relay to initiate stepping thereof; second relay means in parallel circuit with the stepping relay for simultaneous energization therewith, said first and second relay means cooperating to complete an energizing circuit for the control switch means in response to de-energization of the stepping relay; and third relay means in circuit with the third group for controlling the latter to de-actuate an actuated latching relay following operation of the instructing means associated with the latter; whereby electrical request signals produced by each of the serving stations control operation of the instructing means associated therewith.

3,886,415

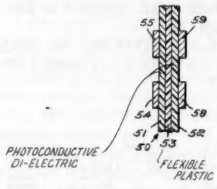
CAPACITOR WITH PHOTO-CONDUCTIVE DIELECTRIC

James E. Genthe, Chelmsford, Mass., assignor to Itek Corp., Lexington, Mass.

Division of Ser. No. 190,296, Oct. 18, 1971, Pat. No. 3,732,100, which is a continuation-in-part of Ser. No. 9,389, Feb. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 717,502, April 1, 1968, abandoned. This application Nov. 24, 1972, Ser. No. 309,564

Int. Cl. H01g *3/06*

U.S. Cl. 317—258 **4 Claims**



1. An electrical device comprising a base having oppositely facing first and second surfaces formed of photoconductive material of (1) sufficient photosensitivity that upon exposure to actinic light and contact with a physical developer an electrically conductive metal image is produced and (2) possessed of dielectric properties sufficient to make the material suitable as the dielectric layer in an electrical capacitor, a first electrically conductive electrode on said first photoconductive material surface, and a second electrically conductive electrode on said second photoconductive material surface wherein said base comprises an electrically insulating substrate with opposite faces supporting deposited layers of photoconductive material.

3,886,416

METHOD AND APPARATUS FOR ADJUSTING COROTRON CURRENTS

Charles F. Gallo, Jr., Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 7, 1973, Ser. No. 422,632

Int. Cl. G03g *15/02*

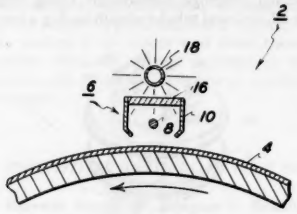
U.S. Cl. 317—262 A **3 Claims**

1. An apparatus for applying electrostatic charge to a photoconductive surface, including:

a corona generator, including a corona electrode operatively disposed within a corona shield, to emit corona current,

a photoconductive surface disposed adjacent to said corona generator to receive said corona current and thus to acquire electrostatic charge when in an insulative condition,

said apparatus including means to establish a steady corona current from said corona electrode to said photoconductive surface, said means including a lamp, integral with said corona shield, said lamp being operative to illuminate said photoconductive surface to render the same



conductive for the establishment of said steady corona current, and said lamp being inoperative to allow said photoconductive surface to acquire electrostatic charge.

3,886,417

METHOD AND APPARATUS FOR CONTROLLING MULTIPLE SUSPENSION CRANES

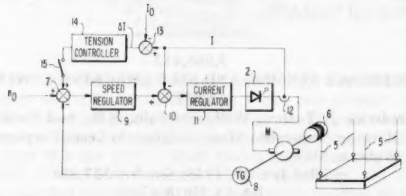
Koichi Niwa, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki-shi, Kanagawa, Japan

Filed Mar. 28, 1974, Ser. No. 455,828

Claims priority, application Japan, Mar. 28, 1973, 48-35401

Int. Cl. H02p *7/68*

U.S. Cl. 318—7 **3 Claims**



1. A method for controlling a multiple suspension crane system of the type which includes a set of four independently controllable crane units or an equivalent set of such crane units for suspending a load by warps connected to four different suspension points on the load, each of the crane units including an electric motor operable to take up the warp of its crane unit and a speed controller for controlling the speed of the electric motor, said method comprising the steps of:

a. determining a permissible range of component load imposed on the specific suspension point nearest the center of gravity of the total load by actually increasing and decreasing the amount of component load on said specific suspension point, and

b. using the mid-value of said permissible range of component load to produce a reference warp tension signal to compensate the speed controller of the specific electric motor operating to take up the warp connected to said specific suspension point.

3,886,418

SET POINT CONTROLLER

Dennis R. Austin, and Wilbern W. McNease, both of Beaumont, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 217,196, Jan. 12, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 413,026

Int. Cl. G05b *15/02*

U.S. Cl. 318—15 **2 Claims**

1. A control system comprising a plurality of analog control devices each responding to an analog control signal comprising:

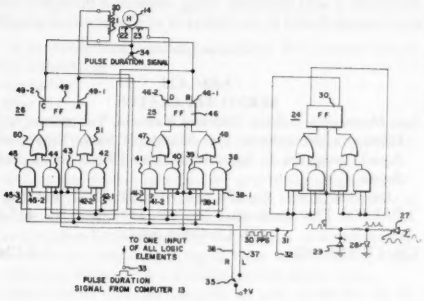
a digital computer responsive to inputs from said system, said computer producing a plurality of set point signals including a variable pulse width signal representative of a change in at least one of said inputs, and continuous raise or lower signals controlling the direction of control of each of the devices and persisting until a predetermined, desired adjustment is accomplished;

a plurality of set point controllers, each of said set point controllers being responsive to one of said set point signals, each of said set point controllers including:

an incremental step motor comprising a plurality of windings and a rotor, selective energization of the windings of said motor causing incremental rotation of the rotor of said motor;

a potentiometer including a rotatable shaft coupled to said motor for producing an analog control signal as an output in response to rotation of the rotor of said motor;

two bi-stable flip-flops each having two outputs and a set and a reset input, one output of each flip-flop being connected to one side of each of the windings of said motor,



the other output of each flip-flop being connected to the other side of each of said motor windings, said variable pulse width signal being applied to energize said flip-flops only during the time duration of said pulse, each of said flip-flops being of the toggle type having two enable inputs and a toggle input,

a source of clock pulses, the source in each set point controller being synchronized to the frequency of the same local line power, said source of clock pulses being applied to the toggle inputs of said flip-flops, and

two AND gates connected through an OR gate to each of the set and reset inputs of each flip-flop, the output of said flip-flops being connected to the inputs of said AND gates to determine the switching sequence when said raise signal is present and in a second switching sequence when said lower signal is present, whereby the same pulse width signal produces the same analog control signal in different controllers because of the synchronization of each controller to the same line power frequency and because the same logic circuitry is used in both a raise and a lower sequence.

3,886,419

ELECTRICAL REFRIGERATING COMPRESSOR

Morikazu Omura, and Masao Okuda, both of Tokyo, Japan, assignors to Sawafuji Electric Company, Ltd., Japan

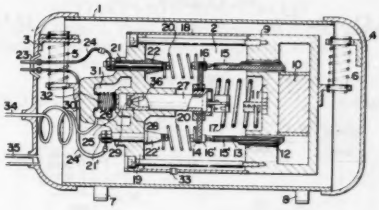
Filed Apr. 10, 1974, Ser. No. 459,652

Claims priority, application Japan, Apr. 14, 1973, 48-42429; Mar. 20, 1974, 49-31752

Int. Cl. H02k *33/00*

U.S. Cl. 318—132 **27 Claims**

1. An electrical machine comprising a vibration type compressor including a mechanical vibration system having a drive coil with at least one spring resonant with the drive coil, an electrical vibration system having semiconductor switching elements of the type with a control electrode for switching-control according to variable factors of the electrical vibration system in relation to the vibration of the drive coil, and a control transformer of unsaturated core type for controlling the on and off of the semiconductor switching elements, the



electrical vibration system being constructed and arranged to operate at the natural vibration cycle of the mechanical vibration system according to the movement of the mechanical vibration system, and at the same time, the electrical vibration system supplying the mechanical vibration system with electric power necessary to operate the mechanical vibration system.

3,886,420

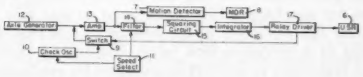
FREQUENCY RESPONSIVE SPEED CONTROL APPARATUS

William K. Butler, and J. Donald Hughson, both of Rochester, N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,674

Int. Cl. H02p *5/00*

U.S. Cl. 318—327 **12 Claims**



1. Speed sensing apparatus for sensing speed in excess of a selectable predetermined speed comprising,

signal source means producing signals at a frequency proportional to vehicle speed,

signal combining means connected to said signal source means,

a high-pass filter connected to said signal combining means, said filter having a cut-off frequency selectable and proportional to said predetermined speed,

bistable output means, connected to the output of said filter, and operated to one state in response to a signal from said filter, and operated to said other state in response to the absence of a signal from said filter,

a check oscillator tuned to a selectable frequency slightly higher than said cut-off frequency of said filter,

switch means controlled by said bistable output means to pass signals from check oscillator when said bistable output means is in said one state,

said switch means connected between said check oscillator and said signal combining means

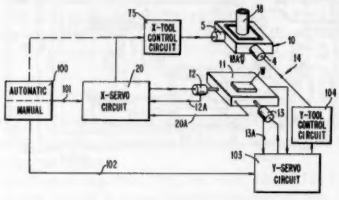
said signal combining means suppressing signals from said signal source means when said check oscillator signals are applied to said signal combining means by said switch means.

3,886,421

PRECISION TOOL AND WORKPIECE POSITIONING APPARATUS WITH RINGOUT DETECTION

Javathu K. Hassan, Hopewell Junction; Carl V. Rabstejnek, Wappingers Falls, and Anthony D. Wutka, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,502
Int. Cl. G05b *11/18*
U.S. Cl. 318—593 **11 Claims**



1. Apparatus for positioning first and second elements in a precise predetermined relationship one to the other, said apparatus comprising: positioning means for positioning said first element into a predetermined site, a control means having a signal output indicating the desired position of said first element relative to said second element from a fixed reference; position indicating means to provide a signal indication of the actual position of said first element at any one time relative to said reference; comparing means having an output signal responsive to the difference between the signal output of said control means and the signal output of said position indicating means; and position drive means to drive said positioning means in response to said difference signal until said first element is within said predetermined site; and means for stopping said positioning means upon said difference signal reaching a predetermined value such as to indicate that said first element is within said site; gate means, ring out detection means operatively coupled to said position indicating means for determining the rate of change of the position of said first element, and means connecting said ring out detection means to said gate means; said ring out detection means including means for supplying a first signal input to said gate means upon the rate of change of the position of said first element arriving at a predetermined value; and second positioning means responsive to said difference signal for positioning said second element in a precise location relative to said first element.

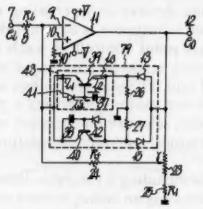
3,886,422

SERVO APPARATUS

Isao Masuzawa, Tokyo; Shin-ichi Kawada, Yokohama; Yoichi Hirokawa, Kamakura, and Masatoshi Sato, Tokyo, all of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Division of Ser. No. 258,388, May 31, 1972, Pat. No. 3,793,576. This application Jan. 28, 1974, Ser. No. 437,057
Int. Cl. G05b *6/02*
U.S. Cl. 318—621 **6 Claims**

1. A servo apparatus comprising a drive unit for positioning a controlled element, a relay like actuator with its output connected to the input of said drive unit, a first feedback generator driven by said drive unit, a summing device receiving an input command signal and an input from said first feedback generator, an operational amplifier with its output connected to the input of said relay like actutor and its input connected to said summing device, a resistive feedback path connected between the output and input of said operational amplifier, a second feedback path device connected between the output and input of said operational amplifier and comprising a transistor and a capacitor, said capacitor being connected at its one terminal to the first electrode of said transistor and at its other terminal to the output of said operational amplifier, the second electrode of said transistor being connected to the input of said operational amplifier, and the third electrode of said transistor being connected through a unilateral current device to the output of said operational amplifier.

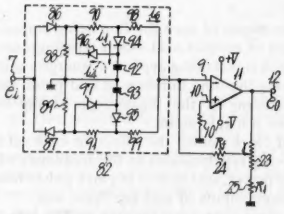


3,886,423

SERVO APPARATUS

Isao Masuzawa, Tokyo; Shin-ichi Kawada, Yokohama; Yoichi Hirokawa, Kamakura, and Masatoshi Sato, Tokyo, all of Japan, assignors to Kabushikikaisha Tokyo Keiki, Tokyo, Japan

Division of Ser. No. 258,388, May 31, 1972, Pat. No. 3,793,576. This application Jan. 28, 1974, Ser. No. 437,069
Int. Cl. G05b *6/02*
U.S. Cl. 318—621 **5 Claims**

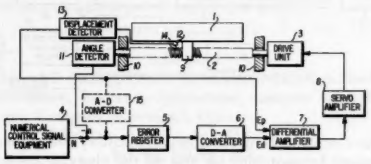


1. A servo apparatus comprising a drive unit for positioning a controlled element, a relay like actuator with its output connected to the input of said drive unit, a first feedback generator driven by said drive unit, a summing device receiving an input command signal and an input from said first feedback generator, an operational amplifier with its output connected to the input of said relay like actuator a resistive feedback path connected between the output and input of said operational amplifier, and an input circuit with its output connected to the input of said operational amplifier and its input connected to the output of said summing device, said input circuit comprising a diode, first, second and third resistors, a capacitor, and a second diode, said first diode being connected between the output of said summing device and the connection point of said first and second resistors, the other end of said first resistor being grounded, the other end of said second resistor being connected to the input of said operational amplifier through said third resistor, said capacitor being charged through said second resistor to provide a delay time constant for the input thereto, the charge stored in said capacitor being discharged through said first resistor and said second diode.

3,886,424
CONTROL SYSTEM HAVING ACTUAL BACKLASH COMPENSATING APPARATUS

Naomi Hoshina, Yokohama, and Etsuji Suzuki, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 14, 1972, Ser. No. 234,611
Claims priority, application Japan, Sept. 10, 1971, 46/70228
Int. Cl. G05b *11/01*
U.S. Cl. 318—630 **7 Claims**

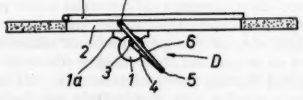


1. A backlash compensating apparatus for a screw driven system comprising:
a worktable,
a drive screw,
a nut,
a drive unit for driving said worktable so as to linearly travel in accordance with said drive screw and said nut,
rotation angle detecting means for generating a signal corresponding to the angle through which said drive screw is made to rotate by said drive unit,
a servo system for determining the position of the worktable by collating said output signal from said rotation angle detecting means with a predetermined input value,
a displacement detector coupled to said worktable to directly mechanically detect a position of said drive screw relative to a position of said worktable to thereby detect errors in the positioning thereof caused by backlash between a starting position of said worktable and a starting position of said drive screw, and
means for correcting said backlash in accordance with output signals from said displacement detector by correcting the input signals to said drive unit.

3,886,425
DRIVE MECHANISM FOR OPENING AND CLOSING DOORS OR THE LIKE

Bruno E. Weiss, Liestal, Switzerland, assignor to Magnetic Elektromotoren AG, Liestal, Switzerland

Filed Nov. 21, 1972, Ser. No. 308,371
Claims priority, application Switzerland, Nov. 29, 1971, 17349/71; Sept. 22, 1972, 13849/72
Int. Cl. H02f *3/00*
U.S. Cl. 318—468 **11 Claims**

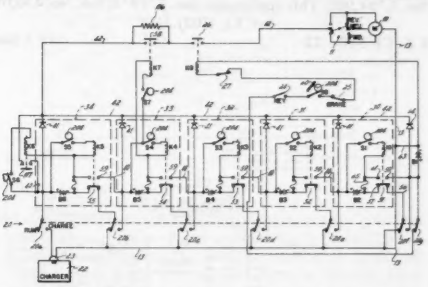


1. An electro-mechanical drive mechanism for opening and closing a door or the like, comprising:
a. a drive unit including a blockable, reversible, continuously switched-on electric motor and having an output drive shaft;
b. a drive lever connected to said output drive shaft;
c. a coupling member hingedly connected to the drive lever and the door; and
d. resiliently flexible stop means associated with said output drive shaft to limit the range of rotational movement of said output drive shaft to less than one complete revolution and resiliently to block said electric motor in two terminal positions.

3,886,426
BATTERY SWITCHING CIRCUIT

Lester Alvin Daggett, Palos Verdes Peninsula, Calif., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Mar. 16, 1973, Ser. No. 342,213
Int. Cl. H02j *7/00;* **H02p** *7/00, 7/20*
U.S. Cl. 320—7 **5 Claims**



1. A battery interconnection circuit for applying different voltages from a plurality of batteries across a load while maintaining substantially uniform current drain from the batteries, comprising, in combination:
a common positive lead and a common negative lead with the load being connectable across said common positive lead and said common negative lead;
a plurality of batteries each with a positive and a negative battery terminal, each for supplying direct current power;
a unidirectional current conducting element connected between each respective positive battery terminal and said common positive lead, to permit current to flow from each said positive battery terminal to said common positive lead;
an input terminal associated with each said battery;
a plurality of switches, each switch connected to a respective negative battery terminal, each such switch providing a connection between the respective negative battery terminal and alternately the respective input terminal or directly to said common negative lead;
a direct electrical connection from each positive battery terminal but one to the input terminal associated with another of said batteries, each such input terminal being connected only to one said positive battery terminal, there being one input terminal associated with one battery and one positive battery terminal of another battery which are not so connected;
an additional battery having a positive terminal and a negative terminal, the negative terminal of said additional battery being connected directly to said common negative lead and the positive terminal of said additional battery being connected directly to said one input terminal;
a further unidirectional current conducting element connected between the positive terminal of said additional battery and said positive common lead to permit current to flow only from said additional battery to said common positive lead;
selective switch closing means for closing in sequence various combinations of said switches to provide a series of different connections of said batteries ranging from a completely parallel connection to a completely series connection to provide a range of voltages across the load while maintaining a substantially uniform current drain from each said battery; and

a short circuit means for providing a direct electrical connection between said one positive battery terminal and said common positive lead only when each said switch is operative to provide an electrical connection between a respective negative battery terminal and a respective input terminal.

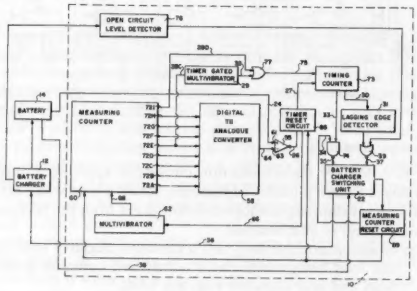
3,886,427
BATTERY CHARGER CONTROL CIRCUIT

Ronald Edwin Long, Lincoln, Nebr., assignor to Lester Electrical of Nebr., Inc., Lincoln, Nebr.

Continuation-in-part of Ser. No. 298,344, Oct. 17, 1972, Pat. No. 3,794,905. This application Jan. 2, 1974, Ser. No. 430,091

Int. Cl. H02j *7/04*

U.S. Cl. 320—22 **15 Claims**



1. Apparatus for controlling the charging of a battery, comprising:

input means for carrying a signal representing the potential of a battery;

measuring means for generating a plurality of energy-level digital signals indicating energy levels of the battery;

timer means for determining when the time between certain of said energy-level digital signals exceed a predetermined maximum time;

control means for selectively reducing and increasing the rate of charging of the battery;

said control means including logic means for causing said control means to reduce the rate of charging of the battery when said time between said certain energy-level digital signals exceeds said predetermined maximum time during a charging run;

said measuring means including a first counter and pulse-generator means for applying pulses to said first counter, whereby said first counter counts said pulses;

said first counter including a plurality of different order first output means;

said timer means including a second counter having an input terminal for receiving pulses for the counting thereof and a plurality of different order second output means;

one of the first output means of said first counter being connected to the input of said timer means, whereby said timer begins time periods under the control of said control means;

said control means including means for increasing the rate of charging of the battery when at least one of said first and said second counters counts to a predetermined one of said output means while said battery charger is not going through a charging run.

3,886,428
ELECTRONIC CONTROL SYSTEM FOR BATTERY CHARGERS

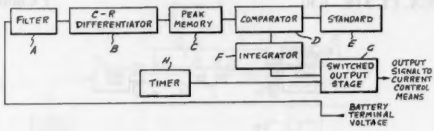
James Adrian Macharg, Bancroft House, Melbury Rd., Newcastle-Upon-Tyne, England

Filed May 14, 1974, Ser. No. 469,763

Claims priority, application United Kingdom, May 17, 1973, 23535/73

Int. Cl. H02j *7/10*

U.S. Cl. 320—39 **16 Claims**



1. An electronic control system for a battery charger including: means for switching on and off the charging current at repetitive intervals in order to provide an open-circuit terminal voltage during the "off" periods; means for providing a signal for controlling the magnitude of the charging current; means for extracting the resultant "I.R Drop" at the battery terminals; means for differentiating the rate of decay of the open circuit terminal voltage of the battery at the said repetitive intervals; means for deriving a voltage which is some function of the differential at the repetitive intervals; means for comparing this voltage derived from the differential with a standard voltage; and means utilizing the difference between said two voltages in order to modify the control signal whereby the magnitude of the charging current is controlled.

3,886,429
DIRECT-DIRECT SYMMETRICAL CONVERTER POWER PACK

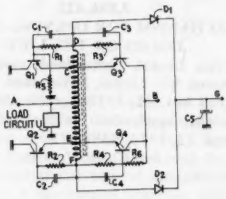
Gilbert Maillard, and Jean Morisset, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 17, 1974, Ser. No. 434,304

Claims priority, application France, Jan. 23, 1973, 73.02270

Int. Cl. H02m *3/14*

U.S. Cl. 321—2 **5 Claims**



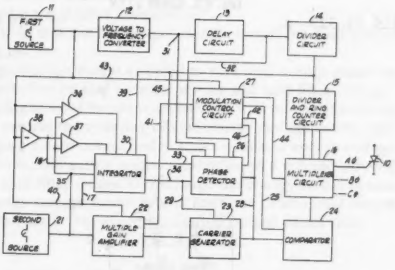
1. A direct-direct symmetrical converter power pack having an input for being coupled to a supply source having a voltage having either one of two predetermined different absolute values and an output and comprising: a converter formed by a transformer having two end terminals, said transformer comprising a winding with a centre tap and further taps; at least one rectifier circuit coupled to said two end terminals of said transformer and comprising an output forming the output of said power pack, a switching circuit comprising first and second terminals, first, second, third and fourth transistors, each having a control electrode and first and second further electrodes, four biasing circuits respectively coupled to said control electrodes of said first, second, third and fourth transistors, said first further electrodes of said first and second transistors being coupled to said first terminal, and said sec-

ond further electrodes of said first and second transistors being symmetrically coupled to said winding relatively to said centre-tap, said first further electrodes of said third and fourth transistors being coupled to said second terminal and said second further electrodes of said third and fourth transistor being symmetrically coupled to said winding relatively to said centre-tap, said first terminal and said centre-tap forming a first input of said converter, said first and second terminals forming a second input of said converter; and a selector device for connecting said input of said power pack either to said first input or to said second input of said converter depending upon the value of said voltage for maintaining at a constant value the voltage at said output of said power pack.

3,886,430
PHASE AND FREQUENCY SYNCHRONIZING CIRCUIT

Udo H. Meier, Lucerne, Switzerland, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Dec. 6, 1973, Ser. No. 422,301
Int. Cl. H02m *1/08*
U.S. Cl. 321—9 A **12 Claims**



1. An apparatus for synchronizing a first wave form and a second wave form to have a given frequency and phase relation, comprising in combination:

a circuit for establishing the first wave form;

a circuit for establishing the second wave form;

detector means for providing an output of the difference from the given frequency relation of the first and second wave forms;

phase modifying means connected between said detector means and one of said circuits for modifying the phase of the second wave form to synchronize the first and second wave forms at the given phase relation;

integrator means connected to said detector means for storing a correction signal in accordance with said output of said detector means;

and means for applying said correction signal to one of said circuits for modifying the frequency of said second wave form to synchronize the first and second wave forms at the given frequency relation.

3,886,431
SYNCHRONIZING CIRCUIT HAVING AN INFINITE NUMBER OF RATIOS

Udo H. Meier, Lucerne, Switzerland, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Dec. 6, 1973, Ser. No. 422,303
Int. Cl. H02m *1/08*
U.S. Cl. 321—9 A **6 Claims**

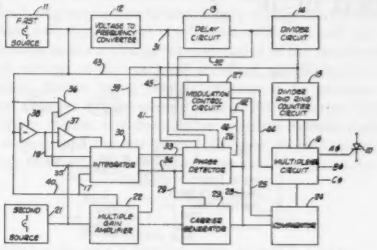
1. An apparatus for synchronizing a first wave form with a second wave form, comprising in combination:

a first circuit for establishing a variable frequency first wave form;

a second circuit for establishing a second wave form at a nominal frequency;

said nominal frequency providing a first integral ratio of said nominal frequency to a given frequency of the first wave form;

means including integrator means for varying the second wave form frequency in accordance with the first wave form frequency to maintain said first integral ratio;

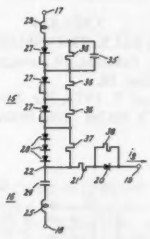


and ratio change means including reset means for resetting said integrator means for re-establishing the second wave form at said nominal frequency resulting in a second integral ratio of the second wave form to the first wave form frequency when the variation of the second wave form frequency reaches a predetermined boundary.

3,886,432
OVERVOLTAGE PROTECTIVE CIRCUIT FOR HIGH POWER THYRISTORS

Dante E. Piccone, Philadelphia, and Istvan Somos, Lansdowne, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Feb. 21, 1974, Ser. No. 444,605
Int. Cl. H02h *7/14*
U.S. Cl. 321—11 **9 Claims**

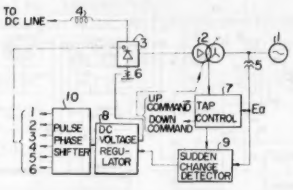


5. For triggering a high-power thyristor, a circuit including overvoltage sensing means connected in series with a capacitor between main terminals of the thyristor and means for coupling the juncture of said sensing means and said capacitor to the control means of the thyristor, whereby the thyristor is triggered when said sensing means switches from a blocking state to a current conducting state in response to forward bias voltage across said main electrodes rising to a predetermined threshold magnitude which is lower than the breakover level of said main thyristor, wherein the improvement comprises means associated with said overvoltage sensing means for relatively reducing said threshold magnitude of forward bias voltage as the rate of rise thereof increases.

3,886,433
CONVERTER CONTROL SYSTEM WITH TAPPED TRANSFORMER PROVIDING CONSTANT NO-LOAD SECONDARY VOLTAGE

Atsumi Watanabe, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 8, 1973, Ser. No. 386,561
Claims priority, application Japan, Aug. 21, 1972, 47-80866
Int. Cl. H02m *7/12*; **G05f** *5/00*
U.S. Cl. 321—18 **4 Claims**

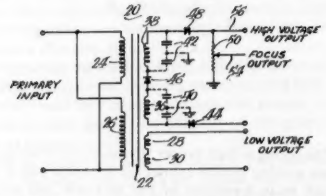


1. In a converter control system applied to a system comprising a converter connected to a DC line and a tapped transformer for connecting said converter to an AC system; the improvement comprising a circuit for generating a reference voltage varying with the position of said tap of said transformer, a circuit for generating a voltage proportional to the primary voltage of the transformer, first means for comparing the voltages of said two circuits and controlling the position of the tap of said transformer, a circuit for generating a voltage corresponding to the controlling delay angle required for maintaining constant the terminal voltage on the DC side of said converter depending on the value of direct current flowing in said converter, a circuit for generating a voltage corresponding to the controlling delay angle required for maintaining constant the extinction angle of said converter depending on the value of the direct current flowing in said converter, and second means for selecting one of the voltages generated by last-mentioned two circuits and applying a firing pulse or a controlling delay angle corresponding to said selected voltage to said converter.

3,886,434
FLYBACK TRANSFORMER

Louis W. Schreiner, Palatine, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Sept. 7, 1973, Ser. No. 395,284
Int. Cl. H02m *7/06*; **H01f** *27/40*
U.S. Cl. 321—27 R **6 Claims**



1. A transformer assembly for generating deflection voltage waveforms in a television receiver, said waveforms being inherently subject to harmonic oscillations caused by distributed capacitance in said transformer, said transformer comprising:

a U-shaped ferromagnetic core having an intermediate section and first and second generally parallel outer legs, a generally rectangular ferromagnetic core segment bridging said outer legs to complete a single window magnetic circuit;

a primary winding having first and second segments;

a split high voltage winding having first and second segments;

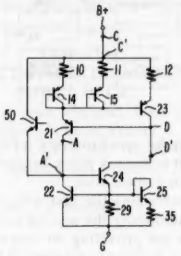
a pair of low voltage bobbins carrying said primary segments surrounding and extending along and immediately adjacent to said first and second core legs respectively for substantially the entire length of said window and a pair of high voltage bobbins carrying said first and second high voltage segments respectively and surrounding said low voltage bobbins for substantially the entire length of said window;

voltage rectifier means connected in series with said high voltage winding segments and intermediate the terminating ends of said high voltage winding.

3,886,435
V_{BE} VOLTAGE VOLTAGE SOURCE TEMPERATURE COMPENSATION NETWORK

Steven Alan Steckler, Clark, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,271
Int. Cl. G05f *1/58*
U.S. Cl. 323—4 **19 Claims**



1. A current regulator which supplies a substantially constant current over a substantial range of operating temperatures, comprising:

a source of temperature dependent voltage, said temperature dependent voltage being proportional to the voltage established across a semiconductor P-N junction structure in the conductive state;

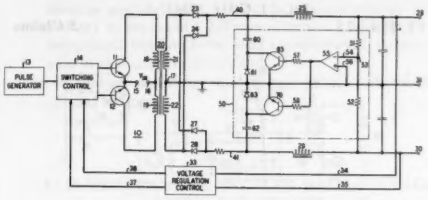
first resistance means coupled in parallel with said source of temperature dependent voltage for drawing current equal to the voltage applied thereacross divided by the resistance of said first resistance means; and

serially coupled P-N junction structure and second resistance means coupled in parallel with said source of temperature dependent voltage and said first resistance means such that the potential across said serially coupled P-N junction structure and second resistance means equals the potential across said source of temperature dependent voltage, the current in said serially coupled P-N junction structure and second resistance means thereby having a temperature coefficient which is proportional to the negative of the temperature coefficient of current in said first resistance means for substantially compensating for said temperature coefficient of current in said first resistance means over a substantial range of operating temperature.

3,886,436
REGULATOR TO CONTROL TRACKING OF DUAL OUTPUT CONVERTER

James Carroll Wadlington, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 6, 1974, Ser. No. 440,066
Int. Cl. G05f *1/60*; H02m *3/32*
U.S. Cl. 323—8 7 Claims



1. In a converter circuit including dual output means comprising rectifier means and filter means,

a tracking regulator comprising,

means to monitor the output signal ratio of the dual output means,

energy storage means coupled to said dual output means at a junction of said rectifier means and said filter means,

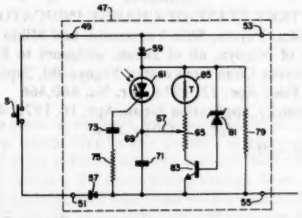
charging control means responsive to said means to monitor to control the charging of said energy storage means, and

gating means connected in series with said energy storage means, said gating means responding to a voltage induced by said filter means to discharge the energy stored in said energy storage means into at least one of said dual output terminals to maintain the desired output signal ratio.

3,886,437
STABLE THRESHOLD CIRCUIT

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 134,214, April 15, 1971, Pat. No. 3,793,556. This application Aug. 6, 1973, Ser. No. 385,835
Int. Cl. H05b *41/36*
U.S. Cl. 323—8 1 Claim



1. A circuit comprising first and second input terminals for connection to a source of supply voltage,

threshold signal means for providing a threshold signal derived from said supply voltage and comprising voltage divider means having first, second, and pick-off terminals, including a first impedance means connected between said first terminal and said pick-off terminal of said voltage divider means and a second impedance means connected between said pick-off terminal and said second terminal of said voltage divider means,

said first terminal of said voltage divider means being connected to said first input terminal,

switching means having first, second and control terminals, said first terminal of said switching means being connected to said second terminal of said voltage divider means, and said second terminal of said switching means being connected to said second input terminal,

a voltage responsive switching device connected between said first input terminal and said control terminal of said switching means,

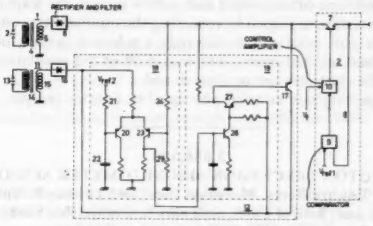
storage means connected between said pick-off terminal and said second input terminal, and

third impedance means connected between said first and second input terminals, said voltage responsive switching device being responsive to said supply voltage for rendering said switching means conductive, whereby said storage means stores a charge representative of the threshold signal voltage at said pick-off terminal, said voltage responsive device being further responsive to predetermined changes in said supply voltage for rendering said switching means non-conductive, thereby substantially preventing said predetermined changes in said supply voltage from affecting the charge on said storage means.

3,886,438
VOLTAGE-REGULATED POWER SUPPLY UNIT

Antonius Fredericus Mattias Bouman, Hengelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Sept. 24, 1973, Ser. No. 399,857
Claims priority, application Netherlands, Sept. 26, 1972, 7212971
Int. Cl. G05f *1/56*, *1/64*
U.S. Cl. 323—22 T 10 Claims



1. Voltage-regulated power supply unit a first and second voltage source producing a fluctuating d.c. voltage, a first and second regulator connected to the first and second voltage sources, respectively, a feedback circuit connected to the output of said first regulator, which feedback circuit comprises a first comparator providing a control voltage related to the difference between the output voltage of said first regulator and a first fixed reference voltage for regulating the output voltage, means including a power transistor whereby the second regulator establishes a connection between the second voltage source and the first regulator during the time when the second regulator is registering a voltage generated by the first voltage source, which voltage is below the sum value of the required minimum operating voltage of the first regulator and said output voltage, for the purpose of maintaining a d.c. voltage which is at least equal to said sum value and to be supplied to the first regulator, and a differential amplifier which supplies a control voltage to said power transistor which is derived from the difference voltage between the voltage applied to the input of the first regulator and a second fixed reference voltage.

3,886,439

METHOD OF SEPARATING BROAD AND NARROW LINES OF A FREQUENCY SPECTRUM

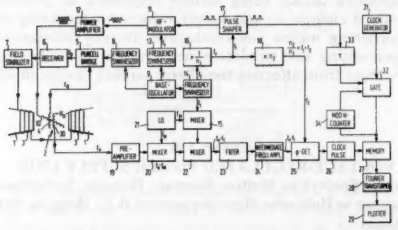
Günther Rudi Laukien, Am Silberstreifen, 7501, Forchheim, Germany

Continuation-in-part of Ser. No. 147,652, May 27, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,453

Claims priority, application Germany, July 30, 1970, 2037761

Int. Cl. G01n *27/78*

U.S. Cl. 324—.5 R **8 Claims**



1. A method of separating broad and narrow lines of a frequency spectrum in the same frequency range in spin resonance spectrometry, comprising the steps of:

exciting all of the oscillations of the spectrum at the same time in a given substance;

selectively recording those oscillations corresponding to only one of said broad and narrow lines in the form of an interference signal by recording the oscillations produced in said substance during only a selected portion of the time interval during which said all of the oscillations of the spectrum are produced; and

subjecting said interference signal to Fourier analysis.

3,886,440

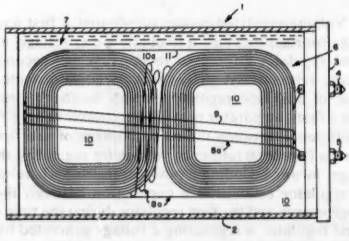
PROTON PRECESSION MAGNETOMETER SENSOR

Mark Edward Berry, Mountain View, and Thomas R. Tullsen, San Jose, both of Calif., assignors to GeoMetrics, Sunnyvale, Calif.

Filed Oct. 23, 1973, Ser. No. 408,267

Int. Cl. G01r *33/08*

U.S. Cl. 324—.5 E **10 Claims**



1. In a proton precession magnetometer having a housing for containing a proton-ladened fluid, a sensor comprising:

a plurality of turns of multi-strand wire forming a main coil means for increasing the signal-to-noise ratio of said sensor; and

means for mounting said main coil means within said housing.

3,886,441

ADAPTER FOR COUPLING A MEASURING INSTRUMENT TO AN ELECTRICAL IGNITION SYSTEM

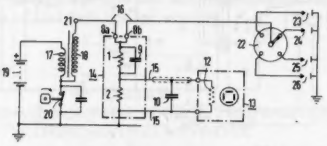
Hans-Werner Kranz, and Herbert Lucke, both of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 6, 1973, Ser. No. 376,940

Claims priority, application Germany, July 11, 1972, 2234055

Int. Cl. G01r *13/42*

U.S. Cl. 324—15 **3 Claims**



1. An electrical adapter apparatus for coupling an electronic measuring instrument to the ignition system of an internal combustion engine, comprising:

an ohmic voltage divider, including a pair of resistors coupled in series for dividing a voltage signal;

an electrically conductive member comprising an annular ring, disposed about and spaced apart from one of said resistors of said voltage divider, and coupled in series to both of said resistors of said divider;

electrically conductive contact members, coupled to said voltage divider resistors and said conductive member, for transmitting a signal representative of the ignition voltage to the electronic measuring instrument;

a conductive base member coupled to said one of said voltage divider resistors and to one of said contact members;

an electrically conductive bridge member coupled to said annular ring and said base member;

a conductive plate member having a curved end portion disposed adjacent said annular ring and said resistors and coupled to the other one of said contact members; and

a curved shield member, mounted on said plate member adjacent said voltage divider resistors.

3,886,442

BATTERY STATE-OF-CHARGE INDICATOR

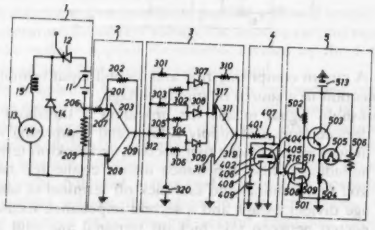
Takewo Chiku, Toyota; Shin Yamamoto, and Mikio Huruhashi, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya-shi, Japan

Filed Apr. 12, 1974, Ser. No. 460,466

Claims priority, application Japan, Apr. 16, 1973, 48-43463

Int. Cl. G01n *27/42*

U.S. Cl. 324—29.5 **10 Claims**



1. An actual state-of-charge indicator for a secondary battery comprising:

a detecting means for detecting a discharging current exerting within an electric load circuit driven by said battery;

a compensation means for converting the discharging

current to a compensated current substantially satisfying an equation $I=mI_B^n$, the characters I and I_B being the compensated current and the discharging current respectively, and the constants m and n being experimentally defined by the changes of the known fully charged capacity of said battery in relation to the changes of the discharging current to satisfy Peukert Equation;

an integration means for storing an ampere-hour corresponding with said known fully charged battery capacity therein and detecting an actual state-of-charge of said battery by means of a difference between an ampere-hour integrated therein from said compensated current and said stored ampere-hour; and

an indicating means for reading said actual state-of-charge of said battery.

3,886,443
ELECTRIC CAMERA SHUTTER WITH VOLTAGE CHECKING CIRCUIT

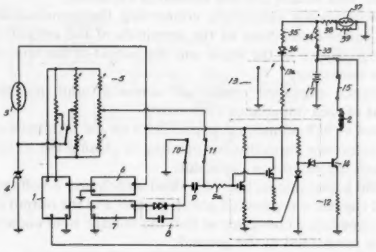
Seinan Miyakawa, Tokyo, and Mitsuhiko Shimoda, Niiza, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 251,764, May 9, 1972, Pat. No. 3,766,116. This application May 29, 1973, Ser. No. 364,741

Claims priority, application Japan, May 13, 1971, 46-37734; May 19, 1971, 46-39721; May 19, 1971, 46-39722

Int. Cl. G01r *27/42;* **G03b** *17/18*

U.S. Cl. 324—29.5 **4 Claims**



1. In a camera, circuitry for automatically determining the extent to which film in the camera is exposed, a voltage source, a main switch connected between said voltage source and said circuitry for transmitting voltage from said voltage source to said circuitry when said main switch is closed, meter means electrically connected with said circuitry for providing information with respect thereto, checking circuit means for checking the condition of said voltage source, said checking circuit means consisting of components which are entirely separate from said circuitry so that none of the components of said checking circuit means are in common with components of said circuitry, and including electronic thermal compensating means for thermally compensating the checking circuit means, said checking circuit means being operatively connected with said meter means for indicating at said meter means the condition of said voltage source, and a normally open switch electrically connected between said checking circuit means and said voltage source to be closed, when said main switch is open, for connecting said checking circuit means between said voltage source and said meter means so that the latter will give a reading indicating the condition of said voltage source.

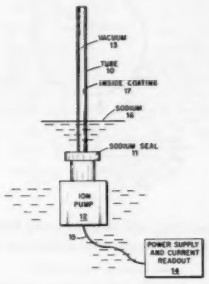
3,886,444
HYDROGEN DETECTOR FOR SODIUM COOLED REACTORS

Prodyot Roy, Saratoga, and Douglas N. Rodgers, San Jose, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 7, 1974, Ser. No. 440,627

Int. Cl. G01n *27/00, 7/10*

U.S. Cl. 324—33 **3 Claims**



1. In a hydrogen detector for measuring hydrogen concentration in liquid sodium comprising a thin-walled diffusion tube constructed from material selected from the group consisting of nickel and stainless steel, ion pump means connected to create a vacuum within said diffusion tube, and power supply and current readout means connected to said ion pump means; the improvement comprising a thin layer of refractory metal selected from the group consisting of tungsten and molybdenum coated on inner wall surfaces of said diffusion tube for controlling the rate of permeation of hydrogen in surrounding liquid sodium through said diffusion tube.

3,886,445
METHOD AND APPARATUS FOR ELECTROMAGNETIC DETECTION OF WELDS IN METAL STRIPS INCLUDING PRESSING MEANS FOR THE STRIP

Iwane Chiba, Fukuyama; Toshihiro Mori, Yokohama, and Noboru Yamazaki, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1973, Ser. No. 407,108

Int. Cl. G01r *33/12*

U.S. Cl. 324—37 **14 Claims**

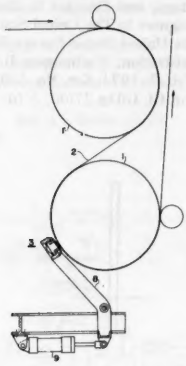
1. A method of detecting the welds in a metal strip comprising the steps of:

tightly winding a moving metal strip comprised of shorter metal strips welded together around a set of bridle rolls for detecting the welds in said metal strip,

locating a detector of the non-contact electromagnetic induction type in the vicinity of said metal strip wound on a bridle roll, said detector including a holder member extending in the direction of the width of the strip and having a plurality of sensors fixedly mounted on said holder member in a row in the direction of the width of the strip, a plurality of protector elements projecting from said holder member adjacent said sensors, and at least one roller rotatably mounted to said holder member in the vicinity of said sensors and projecting from said holder member past the outermost surface of said sensors which face said strip,

pressing said at least one roller against the surface of said strip on said bridle roll for maintaining a substantially constant predetermined gap between said plurality of sensors and the surface of said metal strip and maintain-

ing said sensors in a fixed position for electromagnetic detection of said welds, and



selectively separating said sensors away from said surface of said metal strip to cease said detection of welds.

3,886,446

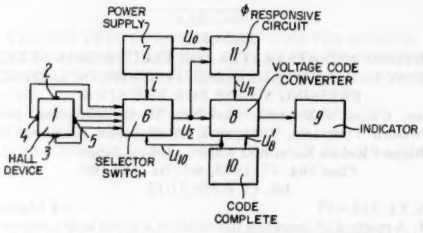
DIGITAL INDICATOR OF THE ELECTROMOTIVE FORCE OF A HALL-EFFECT DEVICE WHICH ELIMINATES THE INFLUENCE OF THE NON EQUIPOTENTIAL VOLTAGE

Sergei Glebovich Laranov, Brest-Litovsky prospekt, 2, kv. 107; Voldmir Vasilievich Braiko, ulitsa Vernadskogo, 75, kg. 18a; Jury Trofimovich Chigirin, prospekt 40 let Oktyabrya, 100-2, kv. 149, and Vladimir Petrovich Belousov, ulitsa Vernadskogo, 61, kv. 3/1, all of Kiev, U.S.S.R.

Filed Oct. 16, 1972, Ser. No. 297,905

Int. Cl. G01r *33/06*

U.S. Cl. 324—45 **2 Claims**



1. A digital indicating instrument for indicating the electromotive force of a Hall-effect device having at least two pairs of opposed electrodes, comprising a selector switch electrically connected with said pairs of said electrodes; a voltage supply source connected to said selector switch to be alternatingly connected to one then to the other of said two pairs of said electrodes by means of said selector switch; a voltage-code converter connected to said selector switch to be alternatingly connected to one then to the other of said two pairs of said electrodes, the voltage source and the voltage-code converter being alternately connected to opposite pairs of electrodes by the connections of the selector switch; a numerical indicator having an input connected to the output of said voltage-code converter; circuit means determining the moment of completion of a coding cycle of said voltage-code converter and generating a signal indicative thereof, the input of said circuit means being connected to said voltage-code converter, the output of said circuit means being connected to said selector switch to switch the connections of the opposite pairs of said electrodes and also to said converter to begin a new coding cycle, the indicator, following the second coding cycle, indicating the electromotive force of the Hall-effect device, while eliminating the influence of non-equipotential voltage.

3,886,447

CAPACITANCE-VOLTAGE CONVERTER

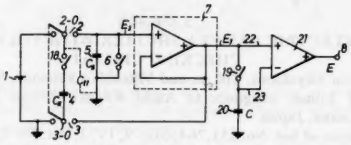
Katsuaki Tanaka, Sagamihara, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed May 16, 1973, Ser. No. 360,690

Claims priority, application Japan, May 17, 1972, 47-48102; Dec. 27, 1972, 48-3940; Dec. 27, 1972, 48-3941; Dec. 27, 1972, 48-3942

Int. Cl. G01r *11/52*

U.S. Cl. 324—60 CD **3 Claims**



3. A capacitance-voltage converter, comprising:

a reference voltage source for producing a reference dc voltage;

an impedance converter having a high input impedance and a low output impedance and developing a voltage at the output equal to the voltage at the input thereof;

a first switch connected in series to a capacitor of unknown capacitance to be determined to form a series-connection of the first switch and the measured capacitor;

gang-switches for selectively connecting the terminals of said series-connection to the terminals of the reference voltage source or the input and the output of the impedance converter;

a reference capacitor connected across ground and the input of said impedance converter;

a second switch connected in parallel with the terminals of the reference capacitor for opening or closing the terminals of the reference capacitor;

a second series-connection of a third switch and a voltage-hold capacitor connected across ground and the output of the impedance converter so that the voltage-hold capacitor is connected to the ground;

a differential amplifier having one input connected to the output of the impedance converter and the other input connected to a junction between the voltage-hold capacitor and the third switch; and

output terminal means connected to the output of the differential amplifier for providing an output voltage corresponding to the unknown capacitance.

3,886,448

METHOD AND APPARATUS FOR TESTING HIGH-VOLTAGE DIVIDERS

Ivan Fedorovich Drabenko, ulitsa Dimo 9/3, kv. 41, and Ivan Yakovlevich Daniljuk, ulitsa Tolbukhina, 2, kv. 46, both of Kishinev, U.S.S.R.

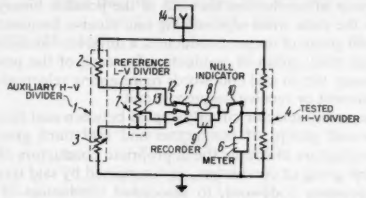
Filed Nov. 5, 1973, Ser. No. 412,721

Int. Cl. G01r *27/02*

U.S. Cl. 324—63 **2 Claims**

1. A method of testing a high-voltage divider, for example for several hundreds kilovolts, under actual high-voltage working conditions, comprising the steps of comparing the conversion ratio of the divider being tested under actual operating conditions with the conversion ratio of a low-voltage reference voltage divider which is selected to be equal to the rated value of that of the tested divider; connecting an additional voltage divider in parallel with the tested divider and adjusting the conversion ratio of the additional divider to be

equal to that of the tested divider; operating both the tested divider and the reference divider under their own working voltages, that across the latter being lower by several orders than that across the former; inserting the reference divider in



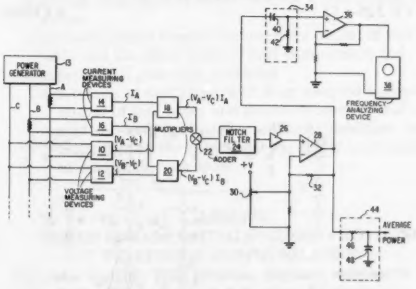
the circuit of the additional divider; then measuring a potential difference between the outputs of the tested divider and the reference divider; and calculating the conversion ratio of the tested divider from the potential difference.

3,886,449

POWER MEASUREMENT CIRCUIT

John F. Wolfinger, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,606
Int. Cl. G01r *21/00*
U.S. Cl. 324—142 **6 Claims**



1. Apparatus for detecting non-synchronous frequency power oscillations in a power transmission system transmitting power at a synchronous power generating frequency, said apparatus comprising:

first means for generating a first signal representative of total instantaneous power in said transmission system;

second means for removing a frequency component of said first signal corresponding to said power generating frequency;

and third means for removing an average value component from said first signal to produce a second signal representative of power oscillations in said transmission systems at frequencies other than said power generating frequency.

3,886,450

WIRELESS PORTABLE TACHOMETER

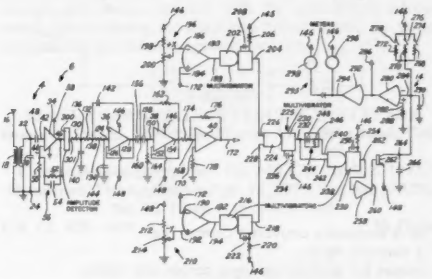
Gerald C. Trussell, Chicago, and James R. Caruth, Des Plaines, both of Ill., assignors to Sun Electric Corporation, Chicago, Ill.

Filed Aug. 6, 1973, Ser. No. 386,033
Int. Cl. G01p *3/48*
U.S. Cl. 324—170 **29 Claims**

1. Apparatus for measuring the rate of operation of an internal combustion engine which emits valid electromagnetic radiation signals at a repetition rate corresponding to the rate of operation, comprising, in combination:

antenna input means having a predetermined resonant frequency for producing in response to each of the radiation signals a resonant signal at the resonant frequency having a positive voltage amplitude peak and a negative voltage amplitude peak;

valid signal detection means for generating a control pulse in response to each resonant signal having a positive voltage amplitude peak greater than a predetermined



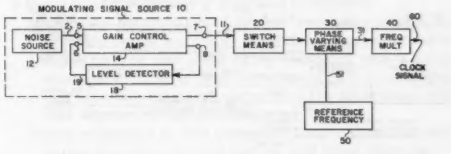
voltage, a negative voltage amplitude peak less than a second predetermined voltage and a time period between the positive and negative voltage amplitude peaks less than a predetermined time so that valid electromagnetic radiation signals are distinguished from noise signals; and output means responsive to the repetition rate of the control pulses for indicating the rate of operation of the engine.

3,886,451

RANDOM PHASE MODULATING TIME BASE AND METHOD TO IMPROVE MEASUREMENT AVERAGING COUNTER RESOLUTION

David C. Chu, Woodside, and John H. Gliever, San Jose, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 28, 1974, Ser. No. 437,460
Int. Cl. G04f *11/06*
U.S. Cl. 324—186 **16 Claims**



1. A method for improving resolution of a time interval measuring device wherein reference pulses at a constant frequency are counted comprising the steps of:

time varying during a measurement period the phase relationship between an applied signal having a plurality of repetitive intervals to be measured and the reference pulses;

applying the reference pulses to a gate synchronized with the reference pulses;

passing the reference pulses through the gate a plurality of times in response to the applied signal;

counting the number of pulses passed;

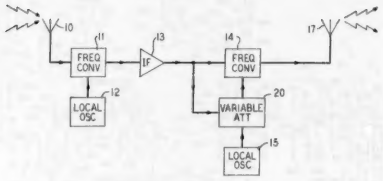
averaging the count obtained; and

multiplying the average by a reference pulse period to obtain a time interval measurement.

3,886,452
LINEAR ELECTROMAGNETIC SYSTEMS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 885,604, Dec. 16, 1969, abandoned. This application Dec. 17, 1973, Ser. No. 425,164
Int. Cl. H04b 7/14
U.S. Cl. 325—11 **9 Claims**

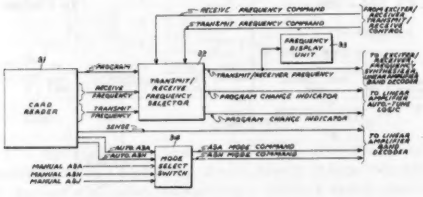


8. A frequency converter comprising
a veractor diode;
means for applying an input across said diode;
means for applying a local oscillator voltage across said diode;
and means, responsive to the instantaneous amplitude of said input signal, for proportionately varying the instantaneous amplitude of said local oscillator voltage in time phase with the instantaneous amplitude variations of said input signal.

3,886,453
CARD-PROGRAMMED FREQUENCY CONTROL UNIT FOR A TRANSCEIVER

Saverio Michael Quintiliani; Alan Grad Finkel, both of Raleigh, N.C.; Harry Richard Smith, Verona, N.J.; Peter Anthony Damiano, Jr., Raleigh, N.C., and Douglas Michael Spranger, Brooklyn, N.Y., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 18, 1974, Ser. No. 462,054
Int. Cl. H04b 1/50
U.S. Cl. 325—25 **18 Claims**

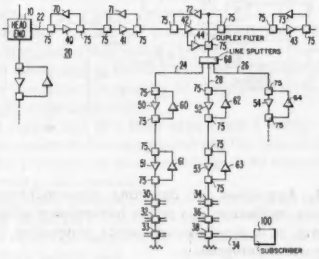


1. A card-programmed frequency control unit for a transceiver comprising:
a housing for said unit including a front panel;
a card reader having an input for cards to be read mounted to and behind said front panel;
a slot in said front panel in registry with said input for said card reader;
a card to be inserted in said slot for reading by said card reader, said card containing thereon a programmed indication selectively representing the transmit or receive mode of operation and a programmed pair of binary coded decimal codewords representing a transmit and receive frequency;
said card reader having a first group of output conductors, a different conductor of said first group of conductors for each of the possible binary bits in the code word representing said transmit frequency and a second group of output conductors, a different conductor of said second group of conductors for each of the possible binary bits in the code word representing said receive frequency;
a third group of output conductors, a different conductor of said third group of conductors for each of the possible binary bits in said codewords representing selectively the transmit or receive frequency; and
a frequency selector circuit coupled between said first and second groups of conductors and said third group of conductors to couple the appropriate conductors of said first group of conductors, as determined by said transmit frequency codeword, to associated conductors of said third group of conductors during said transmit mode and to couple the appropriate conductors of said second group of conductors, as determined by said receive frequency codeword, to associated conductors of said third group of conductors during said receive mode.

3,886,454
CONTROL APPARATUS FOR A TWO-WAY CABLE TELEVISION SYSTEM

Charles Burkhardt Oakley, Princeton, and Hans George Schwarz, Pennington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 13, 1973, Ser. No. 387,600
Int. Cl. H04b 3/04
U.S. Cl. 325—52 **4 Claims**

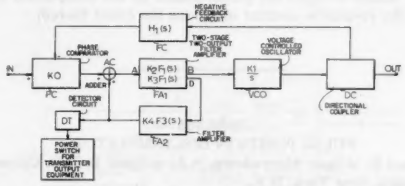


1. In a closed circuit distribution system of the type in which television signals are sent along a transmission line from a central location to a plurality of remote receiver locations for reproduction thereat and in which return signals are also sent along said transmission line back from said remote locations to said central location for processing as part of a two-way communications network, the combination therewith of:
means located between said central and remote locations for electrically disconnecting said central location from selected ones of said remote locations in the presence of return signals below predetermined amplitude levels, including amplifier apparatus having amplitude sensing means responsive to a given threshold, said amplitude sensing means being inhibited by the presence of return signal amplitudes below said given threshold level, but actuated by the presence of return signal amplitude beyond said threshold level to couple said return signals from said remote to said central locations.

3,886,455
PHASE LOCK LOOP INCLUDING AN OSCILLATING SUB-LOOP

Valere G. Jonckheere, Edegem, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,893
Int. Cl. H03b *3/08, 3/14*
U.S. Cl. 325—148 **9 Claims**

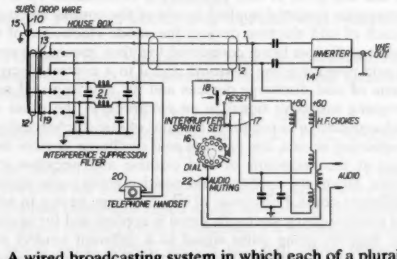


1. A phase lock loop comprising:
a two input phase comparator;
a loop input coupled to one input of said comparator;
a two input adder having one input thereof coupled to the output of said comparator;
a voltage controlled oscillator coupled to the output of said adder;
a feedback circuit coupled between the output of said oscillator and the other input of said comparator; and
a sweep signal generator including
a sub-loop of said phase lock loop coupled between the output of said adder and the other input of said adder, said sub-loop having an oscillatory condition directly controlled by the in-lock and the out-of-lock conditions of said phase lock loop.

3,886,456
WIRED BROADCASTING SYSTEMS PROVIDING TELEPHONE COMMUNICATION

Eric John Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England

Filed Nov. 28, 1972, Ser. No. 310,118
Claims priority, application United Kingdom, Dec. 3, 1971, 56299/71
Int. Cl. H04m *11/08*
U.S. Cl. 325—308 **14 Claims**

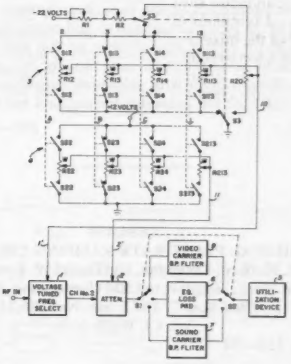


9. A wired broadcasting system in which each of a plurality of subscribers is connected to a programme exchange through the intermediary of a cable with a twisted pair of high frequency conductors suitable for the transmission of high frequency television signals and having associated therewith a twisted pair of intersticial audio frequency conductors suitable for the transmission of audio frequency signals and in which means are provided including a central programme exchange with programme selection means and a telephone exchange, a telephone instrument at the subscribers premises connected to said telephone exchange through said pair of intersticial conductors, and means at said subscribers premises for sending DC signals over at least one of the high frequency conductors to operate said programme selection means having a subscriber's television programme selector switch and including means effecting signalling and control of the subscriber's television programme selector switch at the programme exchange, and means coupled with the subscriber's selector switch disconnecting the telephone circuit during the period required for television programme selection.

3,886,457
LEVEL COMPENSATED FREQUENCY SELECTOR

Danny A. Petaja, 3234 Saint Martins Way, Sebastopol, Calif. 95472

Continuation-in-part of Ser. No. 346,970, April 2, 1973, abandoned. This application Apr. 12, 1973, Ser. No. 350,313
Int. Cl. H04b *1/16;* **H03j** *5/04*
U.S. Cl. 325—399 **10 Claims**



1. In an apparatus including means for selecting and converting a particular channel of a multichannel R.F. input signal to an output signal having a predetermined frequency, a signal level compensating apparatus comprising:
attenuating means coupled to said converting means for selecting one of a plurality of discrete preset attenuation levels each of said levels being associated with a corresponding channel of said multichannel R.F. input signal and for attenuating said output signal in accordance with said selected preset attenuation level; and,
means responsive to said attenuated output signal for indicating the signal level of each of said input channels.

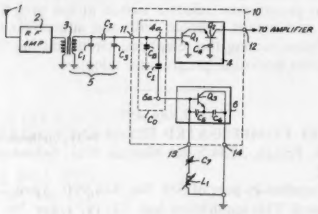
3,886,458
FREQUENCY CONVERTER CIRCUIT WITH INTEGRATED INJECTION CAPACITOR

Shigeo Matsumoto, Sagamihara, Kanagawa-ken; Yukio Tsuda, Atsugi, Kanagawa-ken, and Tadaharu Tsuyuki, Isehara, Kanagawa-ken, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 6, 1973, Ser. No. 422,131
Claims priority, application Japan, Dec. 12, 1972, 47-142880
Int. Cl. H04b *1/28*
U.S. Cl. 325—439 **5 Claims**

1. A signal converter circuit comprising a mixer circuit having input and output terminals, means for supplying input

signals to be converted to said input terminal of the mixer circuit, a local oscillator circuit having an output terminal, a capacitor element formed on a semiconductor substrate and having first and second terminals, said capacitor element providing a main capacitor between said first and second terminals and a stray capacitor between said first terminal and



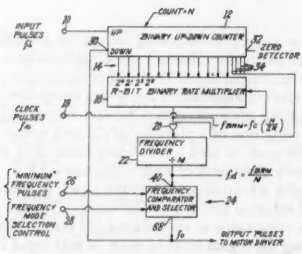
said semiconductor substrate, and means connecting said first and second terminals of the capacitor element to said input terminal of the mixer circuit and to said output terminal of the local oscillator circuit, respectively, so that said main capacitor functions as an injection capacitor for the output of said local oscillator circuit with said stray capacitor being at the side of said injection capacitor toward said mixer circuit.

3,886,459

DIGITAL PULSE RATE RAMPING CIRCUITS

James H. Hufford, Lexington, and Daniel W. Kennedy, Boston, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Aug. 7, 1973, Ser. No. 386,353
Int. Cl. H03k 1/16
U.S. Cl. 328—34 **1 Claim**



1. A circuit for digitally supplying pulses to the motor driver of a stepping motor, said stepping motor responding to each pulse with a step as long as its acceleration capability is not exceeded, comprising:

a. A source of pulses;

b. A reversible counter connected to receive and count the pulses from the source;

c. A clock oscillator for supplying a train of pulses at a specific frequency;

d. A pulse rate multiplier connected to receive the clock pulse train and multiply the frequency of said pulse train by a factor directly proportional to the count accumulated in the reversible counter;

e. A frequency divider connected to receive the modified clock pulse train from the rate multiplier and divide it by a factor suitable to smooth the rate of the modified clock pulse train;

f. A pulse generator for supplying a train of pulses at a minimum rate;

g. A comparator connected to receive the pulses from the frequency divider and the minimum pulse rate generator and to pass whichever of said pulses has the higher rate; and

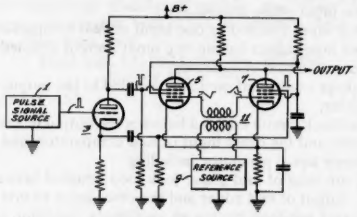
h. Means to apply the pulses passed by the comparator to the reversible counter to reduce the count therein.

3,886,460

PULSE POSITION DISCRIMINATOR

Robert E. Wilson, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 31, 1951, Ser. No. 239,548
Int. Cl. H03k 5/20, 7/04
U.S. Cl. 328—109 **1 Claim**



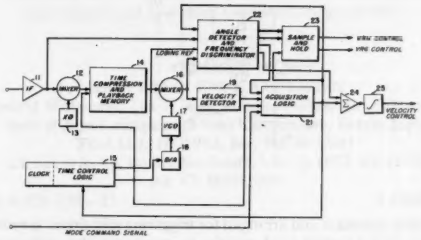
1. A pulse position discriminator comprising, connection means for a source of repetitive pulse signals, means for phase inverting said pulse signals to produce a positive-going pulse signal and a negative-going pulse signal, connection means for a source of repetitive sawtooth reference signals, means for phase inverting said sawtooth signals to produce a positive-going sawtooth signal and a negative-going sawtooth signal, a pair of electron discharge devices having similar grid-anode characteristics and each having cathode, anode, and at least two control electrodes, each of said control electrodes being biased for operation in the linear portions of said characteristics and the gains of said tubes being controllable by the instantaneous potential applied to one of the control electrodes of each of said electron devices the anode electrodes of said discharge devices being connected together, means for applying said positive-going sawtooth signal to a control electrode of one of said discharge devices and for applying said negative-going sawtooth signal to an electrode of the other said discharge device to program the gains of said discharge device in opposing senses, the gains of said discharge devices being equal at the midpoints of said positive and negative going signals, means for applying said positive-going pulse signal to a different control electrode of the discharge device to which said positive-going sawtooth signal is applied and for applying said negative-going pulse signal to a different control electrode of the discharge device to which said negative-going sawtooth signal is applied, and an output circuit connected to said discharge device anode electrodes responsive to application of said pulse and sawtooth signals to said discharge devices for producing output signals having their polarities and amplitudes determined by the timing of said pulse signals with respect to said sawtooth signals.

3,886,461

MISSILE RADAR DOPPLER PROCESSING UNIT

Lloyd J. Hassencahl, Northridge; Leon Chernick, Los Angeles; James N. Jonokuchi, Chatsworth; Joel Katz, Los Angeles, and Richard L. Wooley, Canoga Park, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1972, Ser. No. 230,542
Int. Cl. G01r 23/02; G01s 9/44
U.S. Cl. 328—140 10 Claims



1. A data processing system according to claim 1 in which said second detector includes:

a plurality of band pass filters connected in a parallel relationship and connected to said second mixer;

first summing amplifier means connected to said plurality of band pass filter means for combining the outputs thereof into a single signal channel;

a discriminator means effectively connected to said first summing amplifier means and connected to a phase detector; and

a phase detector means effectively connected to said discriminator and connected to the aforesaid timing control logic means for detecting signals having predetermined relationship with regularly occurring timing signals.

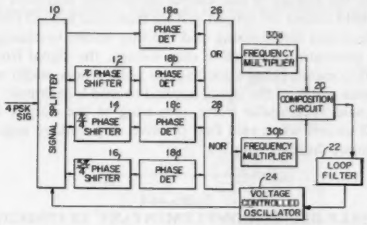
3,886,462

CIRCUIT FOR REPRODUCING REFERENCE CARRIER WAVE

Akira Okano; Yoichi Moritani, and Masahiro Murakami, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1973, Ser. No. 427,099
Claims priority, application Japan, Dec. 27, 1972, 48-2506
Int. Cl. H04l 27/22
U.S. Cl. 329—104 4 Claims

1. A circuit for reproducing a reference carrier wave for a 4 differential phase shift keyed signal, comprising, in combination, a signal splitter circuit for splitting a 4 differential phase shift keyed signal applied thereto into four signal portions, phase shifter means for relatively shifting phases of said four signal portions so that, with respect to a selected one of said signal portions, the remaining three signal portions have phase shifts of π, $\pi/4$ and $5\pi/4$ radians respectively, one phase detector for phase detecting each of the relative phase shifted signal portions, a pair of logic circuits each connected to one pair of the phase detectors producing detected outputs having a phase difference of π radians to switch said detected outputs with a predetermined threshold magnitude, a composition circuit for adding the outputs from said pair of logic circuits,



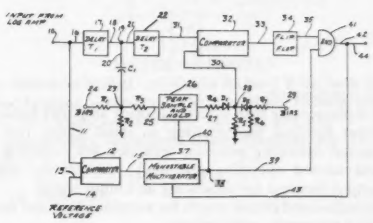
a loop filter coupled to said composition circuit, and a voltage controlled oscillator coupled to said loop filter and to said signal splitter circuit to form a phase locked loop.

3,886,463

PULSE WIDTH DETECTOR CIRCUIT

Samuel J. Caprio, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 9, 1974, Ser. No. 468,328
Int. Cl. H03k 9/08
U.S. Cl. 329—106 3 Claims



1. A pulse width detector circuit receiving simultaneously as an input pulse the detected output pulse from a logarithmic amplifier and a predetermined reference voltage comprising a first comparator receiving said input pulse and said reference voltage, said first comparator generating a step voltage only when the amplitude of said input pulse exceeds said reference voltage, a monostable multivibrator changing from the stable state to the unstable state upon receiving said step voltage, a peak sample and hold circuit, an AND circuit, the output pulse from said monostable multivibrator being used to reset said peak sample and hold circuit and said AND circuit to process said input pulse, first delay means also receiving said input pulse operating to prevent said input pulse from being processed until said monostable multivibrator resets said peak sample and hold circuit and said AND circuit, second delay means receiving a first predetermined delayed signal from said first delay means to provide a second predetermined delayed signal, voltage divider means, bias voltage means connected to said voltage divider, said voltage divider being adjusted so that said first predetermined delayed signal applied to said peak sample and hold circuit is clamped at a level corresponding to the predetermined percentage of the peak amplitude level at the input to said logarithmic amplifier, said peak sample and hold circuit holding the peak level of the clamped pulse, a second comparator receiving the output signal from said peak sample and hold circuit, said second comparator also receiving a second predetermined delayed signal, said second comparator generating a first positive step voltage only when said second predetermined delayed signal is equal to or greater

than said output signal from said peak sample and hold circuit, flip-flop means receiving said positive step voltage changing the state thereof and generating a second positive step voltage, when the trailing edge of said second delayed signal falls below the voltage of said output signal from said peak sample and hold circuit the output voltage from said second comparator becomes zero causing said flip-flop means to change state thus generating a negative step voltage, the signal from said flip-flop means being a rectangular pulse whose width is equal to pulse width of the signal applied to said logarithmic amplifier, said rectangular pulse appearing at the output of said AND circuit when said first positive step voltage appears at the input thereof.

3,886,464

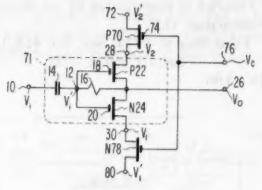
SELF-BIASED COMPLEMENTARY TRANSISTOR AMPLIFIER

Andrew Francis Gordon Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 1, 1973, Ser. No. 365,837

Int. Cl. H03f *3/18*

U.S. Cl. 330—13 **13 Claims**



1. In combination:

a complementary field-effect transistor amplifier having an input terminal for receiving an input signal, first and second operating potential terminals for receiving first and second operating potentials, respectively, and an output terminal for producing an output signal;

first and second circuit points for receiving first and second fixed potentials, respectively;

a control voltage input terminal for receiving a control voltage;

a first variable impedance element having a conduction path connected between said first circuit point and said first operating potential terminal and having an impedance controlling electrode direct current conductively coupled to said control voltage input terminal;

a second variable impedance element having a conduction path connected between said second circuit point and said second operating potential terminal and having an impedance controlling electrode direct current conductively coupled to said control voltage input terminal; and

feedback means coupling said output terminal to said input terminal for establishing said amplifier in a quiescent operating condition.

3,886,465

CLASS B PUSH-PULL OUTPUT STAGE OF AN AMPLIFIER

Johann Mattfeld, Kirchhausen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

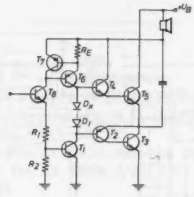
Filed Oct. 16, 1973, Ser. No. 406,939

Claims priority, application Germany, Oct. 27, 1972, 2252666

Int. Cl. H03f *3/26*

U.S. Cl. 330—15 **6 Claims**

1. In an amplifier having a class B push-pull transistor output stage, a driver stage including a driver transistor for triggering said output stage and means for maintaining the collector closed circuit current of the transistors of said output stage independent of temperature fluctuations, and means, including an external load resistance connected in series with the emitter-collector path of said driver transistor across the supply voltage terminals for the amplifier, for maintaining the collector closed circuit current of the transistors of said output stage independent of supply voltage fluctuations, the improvement wherein: said amplifier further includes a signal input transistor having its output connected to the base of said



driver transistor and arranged for triggering said driver transistor; said external load resistance comprises the collector-emitter path of an additional transistor provided with an emitter resistor and forming part of a contstant current source; and said constant current source further includes a further transistor having its base emitter path connected in parallel with said emitter resistor, and its emitter collector path connected into the collector path of said transistor arranged for triggering the said driver transistor, the collector of said further transistor being connected to the base of said additional transistor.

3,886,466

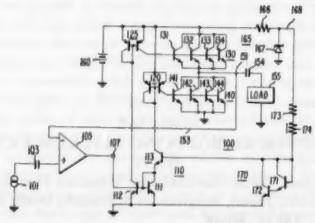
BIAS CIRCUITRY FOR STACKED TRANSISTOR POWER AMPLIFIER STAGES

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1973, Ser. No. 363,562

Int. Cl. H03f *3/26*

U.S. Cl. 330—15 **18 Claims**



1. A circuit for developing first and second, push-pull output currents responsive to an input current comprising:

first, second, third, and fourth circuit nodes, said first and said second nodes being adapted for connecting to a source of said input current, said first and said third nodes being adapted for connection to a source of bias potential;

first, second, third, fourth and fifth transistors of the same conductivity type, each having a base, an emitter and a collector electrode, and each having a forward current gain of substantially beta, the emitter electrodes of said first and said second and said fourth transistors each being direct current conductively coupled to said first node, the base electrodes of said first and said second

transistors each being direct coupled from said second node, said first transistor collector electrode and said third transistor emitter electrode each being direct current conductively coupled to said second node, the collector electrodes of said fourth and said fifth transistors being direct current conductively coupled to said fourth node, said base electrodes of said third and said fifth transistors being direct coupled from said fourth node, said fourth transistor base electrode being direct coupled from said fifth transistor emitter electrode

first and second resistive elements, with similar resistances but relatively beta-dependent and beta-independent, respectively, connected in series between said third and said fourth nodes; and

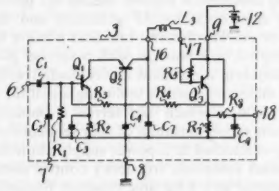
utilization means connected to the collector electrodes of said second and said third transistors, respectively.

3,886,467

HIGH FREQUENCY AMPLIFIER

Seiichi Watanabe, Tokyo, and Takashi Yoshikawa, Fujisawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 18, 1973, Ser. No. 407,604
Claims priority, application Japan, Nov. 2, 1972, 42-127021
Int. Cl. H03f *3/04*
U.S. Cl. 330—21 **5 Claims**



1. A high frequency amplifier comprising:

a. an amplifying circuit having an input terminal and an intermediate output terminal;

b. a transistor having collector, emitter and base electrodes connected in the emitter follower configuration;

c. a power supply terminal connected to the collector electrode of said transistor;

d. a first resistor connected between said power supply terminal and the base electrode of said transistor;

e. a second resistor connected between the emitter electrode of said transistor and a ground;

f. an output terminal connected to the emitter electrode of said transistor; and

g. an impedance matching circuit including a first condenser connected between said intermediate output terminal of said amplifying circuit and said ground and a coil connected between said intermediate output terminal of said amplifying circuit and the base electrode of said transistor, whereby said amplifying circuit and said transistor are connected to each other with proper impedance matching and an operation voltage for said amplifying circuit is supplied from said power supply terminal through said first resistor and said coil.

3,886,468

HIGH GAIN AMPLIFIER

Robert Henry Kruggel, Jericho, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

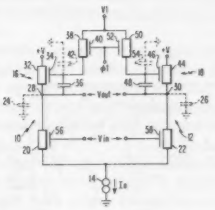
Filed Dec. 20, 1973, Ser. No. 426,845
Int. Cl. H03f *3/68*
U.S. Cl. 330—30 D **10 Claims**

1. An amplifier comprising

first and second controlled current sources having first and second terminals, said first terminals having a common fixed potential,

first and second input dependent current sources,

a constant current source coupled through said first input dependent current source to the second terminal of said



first controlled current source and through said second input dependent current source to the second terminal of said second controlled current source,

means for applying differential signals to said input dependent current sources, and

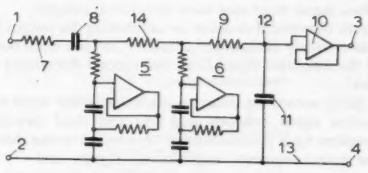
means coupled to said second terminals for deriving output voltages.

3,886,469

FILTER NETWORKS

John Mortimer Rollett, and David Richard Wise, both of London, England, assignors to The Post Office, London, England

Filed Jan. 10, 1974, Ser. No. 432,174
Claims priority, application United Kingdom, Jan. 17, 1973, 2483/73
Int. Cl. H03f *1/36*
U.S. Cl. 330—107 **4 Claims**

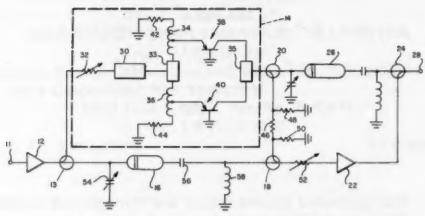


1. An insensitive low-pass filter network comprising an input port including a first and a second input terminal, said first input terminal being connected by way of a first resistor and a first capacitor in series to a first stage of the filter network, said second input terminal being earthed, said first stage being coupled by way of a resistive impedance to one of a plurality of further stages, having a final stage which is coupled by way of a second resistor in series with an input to an output amplifier, and which final stage is coupled to a second capacitor between said input to the output amplifier and the second input terminal, and wherein each stage of the filter network includes a single stage amplifier, having substantially unity gain, and a third resistor connected between an output of the stage amplifier and a junction between a third and a fourth capacitor coupled in series between an input of the stage amplifier and the second input terminal.

3,886,470
FEED-FORWARD AMPLIFIER SYSTEM

William A. O'Neil, Belmont, and George H. Ray, Woburn, both of Mass., assignors to Amplifier Design And Service, Inc., Waltham, Mass.

Filed Dec. 4, 1973, Ser. No. 421,734
Int. Cl. H03f 1/26, 1/00
U.S. Cl. 330—149 15 Claims

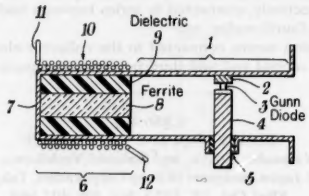


1. A feed-forward amplifier system comprising:
means for applying an input information signal to said amplifier;
a first directional coupler for splitting the input signal;
a main component amplifier for amplifying a portion of the input signal from said directional coupler;
a second directional coupler at the output of said main component amplifier for splitting the amplified information signal;
a third directional coupler for combining the unamplified portion of the input information signal sampled by said first directional coupler and the small portion of the amplified signal from the main component amplifier and said second directional coupler;
an auxiliary component amplifier for amplifying the combined signal from said third directional coupler;
a fourth directional coupler for combining the output from said auxiliary component amplifier and the main portion of the amplified signal from said second directional coupler;
first delay means for delaying the unamplified input information signal between said first and third directional couplers by a predetermined time equal to the delay in the main component amplifier signal path; and
an output terminal coupled to said fourth directional coupler;
said main component amplifier and siad first delay means being part of a sampling loop of said amplifier system; said auxiliary amplifier being part of a correction loop of said amplifier system;
whereby noise and distortion errors injected by said main component amplifier are cancelled by means of the correction loop through said auxiliary amplifier when the auxiliary amplified signal is combined with the main signal at said fourth coupler; and
wherein the output impedance of said main component amplifier is mismatched with respect to the other elements in said feed-forward amplifier system so that signals injected at said output terminal are reflected by said main component amplifier and cancelled by means of said correction loop, thereby matching the output of said feed-forward amplifier system to a transmission line to which said output terminal is connected.

3,886,471
ELECTRONICALLY TUNABLE GUNN OSCILLATOR WITH AUTOMATIC FREQUENCY CONTROL

Massimo Massani, and Giuseppe Di Gesaro, both of Rome, Italy, assignors to Selenia-Industrie Elettroniche Associate S.p.A., Naples, Italy

Continuation-in-part of Ser. No. 291,455, Sept. 22, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 448,865
Claims priority, application Italy, Oct. 5, 1971, 53283/71
Int. Cl. H03b 3/04, 7/14
U.S. Cl. 331—10 4 Claims

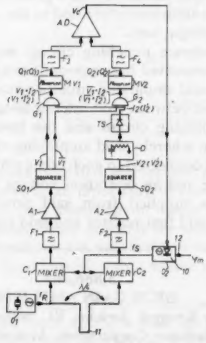


1. A frequency stabilized micro-wave signal source having as active element a semiconductor RF-generator comprising in combination a first portion of waveguide wherein electrically conducting mechanical support means are provided for supporting said semiconductor RF generator and feeding a supply voltage or current thereto; said first portion of waveguide being coupled by a window with a second portion of waveguide constituting a resonant cavity loaded with ferrite supported by a dielectric, further including a coil for producing a magnetic field in which said ferrite is immersed; the voltage or current supply terminal of said semiconductor RF generator being connected to a power supply controlled by a short time constant automatic frequency control circuit, said coil being connected to a long time constant frequency control circuit.

3,886,472
SYSTEM FOR STABILIZING THE OPERATING FREQUENCY OF A FREE-RUNNING OSCILLATOR

Ezio Cottatellucci, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Nov. 12, 1973, Ser. No. 414,830
Claims priority, application Italy, Nov. 10, 1972, 31505/72
Int. Cl. H03b 3/04
U.S. Cl. 331—12 7 Claims



1. A frequency-stabilizing system comprising:

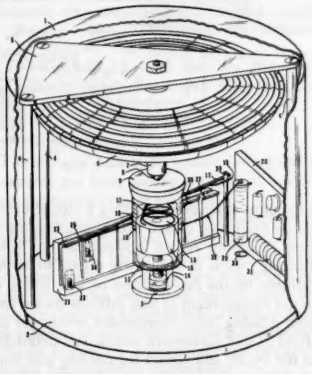
a first oscillator generating a reference frequency;
a voltage-controlled second oscillator having an operating frequency to be clamped to said reference frequency;
first mixer means connected to said oscillators for deriving a first beat frequency from said operating and reference frequencies;
second mixer means connected to said oscillators with interposition of 90°-phase-shifting means in the output of one of said oscillators for deriving a second beat frequency in quadrature with said first beat frequency from said operating and reference frequencies;
binary phase-comparison means connected to said first and second mixer means for generating a first control voltage upon said operating frequency exceeding said reference frequency and for generating a second control voltage upon said reference frequency exceeding said operating frequency; and
circuit means for applying said control voltages to said second oscillator to reduce the difference between said operating and reference frequencies;
said phase-comparison means including a pair of squarers in the outputs of said first and second mixer means for converting said beat frequencies into respective square waves, differentiation means connected to one of said squarers for deriving a spike from one of said square waves at the beginning of every other half-cycle thereof, the other of said squarers having two outputs respectively carrying the other square wave and the complement thereof, a first coincidence gate connected to said differentiation means and to one output of said other of said squarers for receiving said spikes together with the other square wave, a second coincidence gate connected to said differentiation means and to the other output of said other of said squarers for receiving said spikes together with the complement of said other square wave, integrating means for the spikes passed by either of said coincidence gates, and a pair of monostable multivibrators each inserted between one of said coincidence gates and said integrating means, said monostable multivibrators having off-normal periods equal to the minimum cycle length of said beat frequencies.

3,886,473

CAPACITIVE PRESSURE AND DISPLACEMENT TRANSDUCERS

Hans D. Heyck, 38 Sunnyview Dr., Phoenix, Md. 21131

Filed June 13, 1974, Ser. No. 478,975
Int. Cl. G01l *9/12*; **H01g** *5/14*; **H03b** *21/00*
U.S. Cl. 331—42 **3 Claims**



1. In a capacitive transducer for converting a small mechanical displacement into a corresponding electrical signal, the improvement comprising:

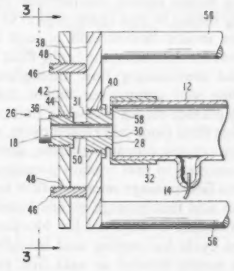
a. a displaced mechanical input member representing the quantity being measured;
b. a variable capacitor comprising a metallic cylinder, free to move axially and concentrically but insulated from a stationary piston; the surfaces of said cylinder and said piston being shaped to yield a predetermined nonlinear capacitance to displacement relationship;
c. a means for connecting said mechanical input member axially to said capacitor-cylinder without requiring exact centering, comprising a flat surface perpendicular to said axis on one of said members, and a convex surface on the other member;
d. an elastic member causing said capacitor-cylinder to press lightly against said mechanical input member;
e. a plurality of magnetic members exerting forces upon each other which causes said capacitor-cylinder to remain in mechanical contact with said mechanical input member;
f. a guide restraining said capacitor-cylinder rotationally;
g. a plurality of stationary, individually adjustable vernier capacitor stators with edges facing an axially slanted metallic edge which is attached to the outer surface of said capacitor-cylinder, thereby forming a plurality of adjustable vernier-capacitors staggered along said displacement-path for trimming the transducer calibration curve in a plurality of locations;
h. a threaded member for adjustment of the insertion depth of said stationary capacitor-piston into said capacitor-cylinder;
i. a plurality of support members controlling the spacing between said mechanical input member and said capacitor-piston, having coefficients of thermal expansion chosen to compensate thermal expansion errors caused by other components.

3,886,474

GAS LASER HAVING AN INTEGRAL OPTICAL RESONATOR WITH EXTERNAL STABILIZING MEANS

Richard A. Hensolt, Portola Valley, and Mark W. Dowley, Palo Alto, both of Calif., assignors to Coherent Radiation, Palo Alto, Calif.

Filed Apr. 30, 1973, Ser. No. 355,710
Int. Cl. H01s *3/08*
U.S. Cl. 331—94.5 C **1 Claim**



1. A gaseous laser having an integral optical resonator comprising:

a. an enclosure for confining the gaseous laser medium;
b. means for exciting said gaseous laser medium to provide energy levels therein required for laser action;
c. an optical resonator comprising a pair of axially aligned mirrors;
d. means for securing said resonator mirrors to form an integral part of said gas-confining enclosure;
e. mirror mounts for adjustably supporting said resonator mirrors, each of said mirror mounts comprising a pair of tubular members having unequal diameters;

f. means external to said enclosure for providing support to and stabilizing said aligned optical resonator mirrors, and external means comprising a plurality of rods of a material having a low coefficient of thermal expansion extending between said optical resonator mirror supports; and

g. means for allowing expansion of the remainder of said enclosure relative to said stabilized resonator mirrors, said expansion allowing means comprises a diaphragm connecting said pair of tubular members, wherein said resonator mirror is mounted to one of said pair of tubular members, and wherein the other of said tubular members is mounted to said enclosure.

3,886,475

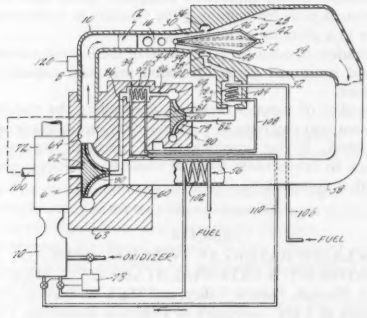
CLOSED CYCLE GAS DYNAMIC LASER

Edward A. Pinsley, North Palm Beach, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 26, 1973, Ser. No. 336,000

Int. Cl. H01s *3/04*

U.S. Cl. 331—94.5 P **3 Claims**



1. A gas dynamic laser device having a closed cycle for the flow of a lasing fluid, said closed cycle including a supersonic nozzle means, a lasing region downstream of said nozzle means, reflecting means in said lasing region to form a lasing cavity, a diffuser means downstream of said lasing region, compressor means for delivering the lasing fluid to said supersonic nozzle and maintaining flow throughout the cycle, means for cooling said compressor means, said means for cooling said compressor means including first passage means for bleeding lasing fluid from said closed cycle, said compressor means having cooling passages therein, said first passage means being connected to said coolant passages, fluid pumping means in said first passage means, a first heat exchanger means located in said first passage means between said fluid pumping means and its connection for bleeding lasing fluid from said closed cycle for cooling said bled fluid, a second heat exchanger means located in said first passage means between said fluid pumping means and said compressor means for removing excess heat added by said fluid pumping means, a reactant supply, second passage means for directing the reactant from said supply to said first heat exchanger means for passage therethrough, third passage means for directing the reactant from said first heat exchanger means to said second heat exchanger means, an expansion turbine being connected to said compressor means for driving it, a combustor for flowing gases through said turbine, said combustor having injection means for receiving reactants, said reactants being a fuel and an oxidizer, fourth passage means for directing the reactant from said second heat exchanger means to the injection means of said combustor.

3,886,476

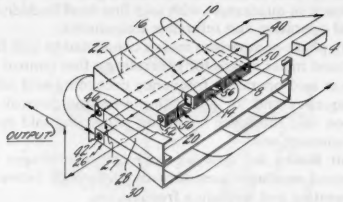
MULTI-STAGE SYSTEM

Donald L. Witt, and Charles F. Staley, both of North Palm Beach, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed May 24, 1968, Ser. No. 733,219

Int. Cl. H01s *1/06, 3/02*

U.S. Cl. 331—94.5 G **10 Claims**



1. A gas dynamic laser device having a plurality of stages for working gas flow, a first stage having first nozzle means for expanding a working gas flow into a first laser cavity and a first diffuser, a second stage having second nozzle means for expanding a working gas flow into a second laser cavity and a second diffuser, said first and second stages being placed side by side with flow therethrough in the same direction, a manifold connecting the outlet of said first diffuser with the inlet of said second nozzle means, means for directing a laser beam through said laser cavities which are located side by side, the sides of said laser cavities adjacent each other being open into each other since the pressure in adjacent laser cavities are maintained equal by sizing said first and second nozzle means.

3,886,477

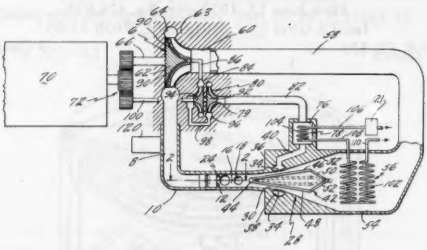
CLOSED CYCLE DEVICE

Lowell E. Ruby; Donald L. Witt, and Charles F. Staley, all of North Palm Beach, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 29, 1968, Ser. No. 772,072

Int. Cl. H01s *3/04, 1/06*

U.S. Cl. 331—94.5 G **13 Claims**



1. A gas dynamic laser device having a closed cycle for the flow of a lasing fluid, said closed cycle including a supersonic nozzle means, a lasing region downstream of said nozzle means, reflecting means in said lasing region to form a lasing cavity, a diffuser means downstream of said lasing region, a heat exchanger downstream of said diffuser means for removing heat from a lasing fluid, compressor means for delivering the lasing fluid to said supersonic nozzle and maintaining flow throughout the cycle, and means for cooling said compressor means including means for directing a coolant fluid to said compressor means at a temperature lower than that of the lasing gas in the cycle at the location of said compressor means.

3,886,478

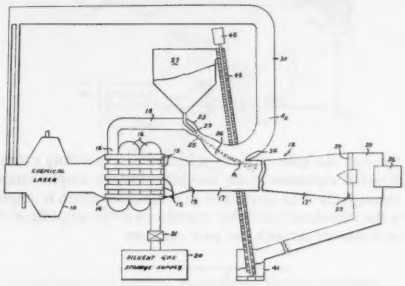
MULTI-COMPONENT FLOW INJECTOR PUMP FOR A FLOWING GAS LASER WITH LOW OUTPUT PRESSURE

Robert W. Milling, Dayton, Ohio, assignor to The Unites States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 319,590, Dec. 29, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,856

Int. Cl. H01s *3/22*

U.S. Cl. 331—94.5 G 4 Claims



1. A gas flow pumping system for a laser having a low pressure output flow, comprising: a high pressure diluent carrier gas supply; means for supplying a flow of said carrier gas to said laser; a heat exchanger having a first flow path connected in the gas flow output of the laser; said carrier gas supplying means including means, for passing the gas from said high pressure supply through a second gas flow path through said heat exchanger; means for accelerating the output gas, from the second gas flow path of the heat exchanger, to a supersonic velocity; means for supplying solid particles to the supersonic velocity flow of gas between the heat exchanger and the laser, for accelerating said particles to a high velocity; means for separating said particles from the flow of carrier gas to said laser; means for directing said separated high velocity particles into the output gas flow of the laser to thereby accelerate the output flow of the laser to a high velocity flow by energy exchange from the particles to the laser output flow; means for converting the kinetic energy of the accelerated laser output gas flow to a gas stream pressure increase.

3,886,479

ELECTRODE SYSTEMS FOR GAS DISCHARGE DEVICES PARTICULARLY GAS LASERS

Peter Reginald Pearson, Baldock, England, assignor to National Research and Development Corporation, London, England

Filed Nov. 23, 1971, Ser. No. 201,455

Claims priority, application United Kingdom, Dec. 4, 1970, 57848/70

Int. Cl. H01s *3/22*, *3/09*

U.S. Cl. 331—94.5 G 16 Claims

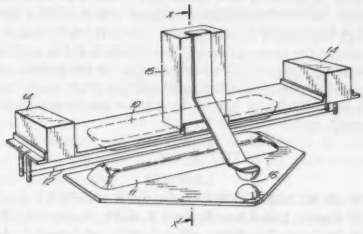
1. In a transverse excitation system for a pulsed high pressure molecular gas laser having a resonant cavity where the transverse excitation system includes:

a. a pair of elongate main discharge electrodes extending longitudinally of said laser cavity and mounted in spaced planes parallel to each other, one of said main discharge electrodes being a cathode, the other of said main discharge electrodes being and anode, each of said main discharge electrodes having active surface portions facing each other, said electrodes defining therebetween a main discharge region for a molecular gas occupying said region; the improvement comprising:

b. at least one elongate conducting auxiliary discharge electrode extending longitudinally of said laser cavity, disposed between said spaced planes but outside said main discharge region, each of said elongate auxiliary discharge electrodes having a constant spatial separation along its length from said cathode, each of said auxiliary discharge electrodes being separated from said main discharge electrodes only by said molecular gas;

c. an electric conducting circuit including an energy limiting means connected between at least one auxiliary discharge electrode and one of said main discharge electrodes;

d. high voltage pulse generating means connected between the said main discharge electrodes;



e. said energy limiting means being operative to produce a potential difference between at least one of said auxiliary discharge electrodes and each of said main electrodes on operation of said high voltage pulse generating means;

f. said potential difference between at least one of said auxiliary discharge electrodes and each of said main electrodes being operative to induce an auxiliary discharge between at least one of said auxiliary discharge electrodes and at least one of the main discharge electrodes, said auxiliary discharge serving to ionize molecular gas in the region in which a main discharge takes place prior to the initiation of discharge between the said main discharge electrodes.

3,886,480

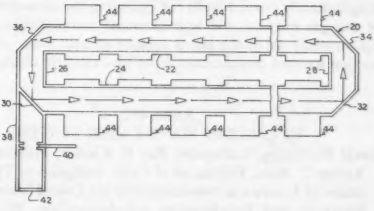
METHOD AND APPARATUS FOR OBTAINING VERY HIGH ENERGY LASER PULSES: PHOTON CYCLOTRON

Victor Vali, 752 North 900 West Apt., Salt Lake City, Utah 84116; Reuben S. Krogstad, 2632 S.W. 120th, Seattle, Wash., 98168 and Raymond Goldstein, 1401 N. Los Robles, Pasadena, Calif. 91104

Filed Apr. 12, 1973, Ser. No. 350,408

Int. Cl. H01s *3/08*

U.S. Cl. 331—94.5 C 29 Claims



1. A method for increasing the energy of laser pulses to very high levels, comprising:

a. arranging a large chamber, the chamber having multiple internal reflecting means to guide a laser beam in a continuous path in the chamber until an escape energy level is reached, the chamber further having an escape exit means which remains closed until opened at an escape energy level of a working unit of a very high energy laser pulse;

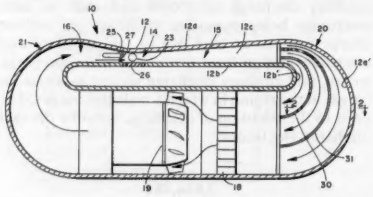
b. arranging multiple spaced laser pumps along the chamber and in communication with the laser beam in the continuous path in the chamber, each laser pump related to an inverted population of a laser energy source;
c. arranging an excitation control system to trigger, in a selected sequence, the multiple spaced laser pumps arranged along the continuous path chamber;
d. placing within the continuous path chamber a laser energy reacting medium; and
e. supplying energy to the excitation control system to timely operate the laser pumps as their respective laser pulse is initiated and thereafter returns to its respective laser inverted population volume which adds a laser energy increment to compensate for reflective losses and to exceed the then occurring laser pulse level to increase the resulting laser pulse to be pumped at the follow on laser inverted population volume, and yet at all times, the laser reacting medium is kept at a level which is below super radiance.

3,886,481

POWER STABILIZED CO_2 GAS TRANSPORT LASER

Jack D. Foster, Los Altos; Russell F. Kirk, Sunnyvale; Frederick E. Moreno, Los Altos, all of Calif., and Samir A. Ahmed, New York, N.Y., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed June 11, 1973, Ser. No. 368,614
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 T **2 Claims**



1. In a high power gas transport laser apparatus comprising a fluid channel, a gas mixture including carbon dioxide in said channel, means for moving and recirculating said gas mixture through said channel, means for producing an electric discharge in said gas mixture transversely of the direction of flow, mirror means optically aligned with said discharge for directing a beam of coherent light therethrough, a heat exchanger in said channel for cooling said gas mixture, said channel being closed and having end sections between said electric discharge and said heat exchanger, said end sections having longitudinally curved walls for changing the direction of flow of the gas mixture, the improvement comprising copper on substantially all of the inner surface of said walls of the end section located downstream from said electric discharge.

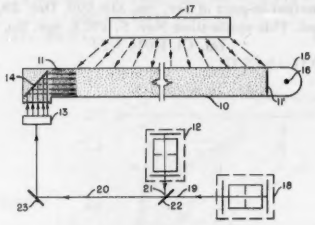
3,886,482

TRAVELING WAVE LASER SYSTEM

David W. Gregg, LaFayette; Ray E. Kidder, Pleasanton, and Arthur T. Biehl, Diablo, all of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 65,758, June 22, 1970, abandoned. This application Sept. 19, 1973, Ser. No. 398,888
Int. Cl. H01s *3/09, 3/02*
U.S. Cl. 331—94.5 G **26 Claims**

1. A method of generating a traveling wave laser pulse comprising the steps of: generating a beam of stimulating radiation; containing in a longitudinal vessel a quantity of gain medium composed of a reactant gaseous mixture capable of producing an exothermic chemical lasing reaction; directing the stimulating radiation longitudinally through the thus contained gain medium; pumping the gain medium in a traveling wave mode creating an amplification zone of population inversion in the gain medium, the stimulating radiation moving with the amplification zone at substantially the velocity of



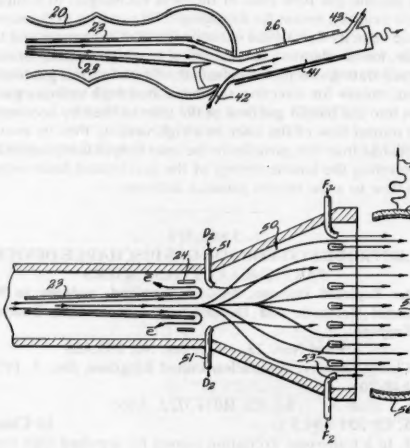
light through the gain medium stimulating a traveling coherent, directed radiation pulse moving with the amplification zone through the thus contained gain medium which is amplified by the stimulated radiation transitions in the amplification zone as it moves through the gain medium.

3,886,483

PLASMA PUMPED LASER

George H. Miley, Champaign, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 31, 1973, Ser. No. 411,556
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 P **11 Claims**

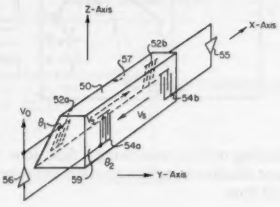


1. A method of pumping the laser active medium of a gas laser system with plasma from a fusion reactor to develop a population inversion in the laser active medium, including the steps of:
a. removing the plasma from a fusion reactor with said plasma including charged particles in the form of an ion fraction and an electron fraction,
b. mixing the laser active medium with a portion of said charged particles to pump said laser active medium and create a population inversion therein,
c. placing said pumped laser active medium in an optical laser cavity to permit a lasing action to take place whereby coherent radiation is developed.

3,886,484
ACOUSTIC SURFACE WAVE DEVICES HAVING IMPROVED PERFORMANCE VERSUS TEMPERATURE CHARACTERISTICS

J. Fleming Dias, and Henry E. Karrer, both of Palo Alto, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 24, 1974, Ser. No. 482,050
Int. Cl. H03b *5/32*
U.S. Cl. 331—107 A **4 Claims**

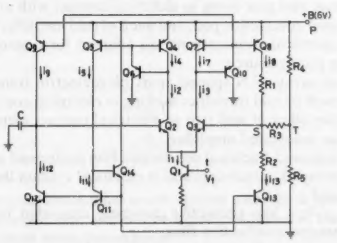


1. An acoustic surface wave delay line comprising:
a substrate of piezoelectric material having a plurality of surface regions of different crystallographic orientations;
at least one transmitting transducer disposed on one of the surface regions for propagating an acoustic surface wave having a first phase-shift response versus ambient temperature characteristic;
at least one receiving transducer disposed on another of the surface regions a predetermined distance from the transmitting transducer for receiving a propagated acoustic surface wave having a second phase-shift response versus ambient temperature characteristic; and
coupling means coupled to the transmitting and receiving transducers for coupling the acoustic surface wave from one of the surface regions to another of the surface regions to provide at the receiving transducer an output signal having a phase-shift response versus ambient temperature characteristic equal to the combination of the first and second phase-shift response versus ambient temperature characteristics.

3,886,485
LINEAR VOLTAGE CONTROLLED OSCILLATOR INCLUDING A TIMING CAPACITOR CHARGED AND DISCHARGED THROUGH CURRENT MIRROR CIRCUITS

Nobuaki Takahashi, Yamato, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 19, 1973, Ser. No. 417,475
Claims priority, application Japan, Nov. 25, 1972, 47-11836
Int. Cl. H03k *3/282*
U.S. Cl. 331—111 **6 Claims**

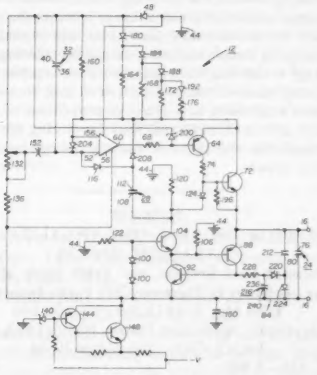


1. A linear voltage controlled oscillator comprising:
a power source;
a pair of transistors having mutually connected emitter electrodes, the base electrode of one of the transistors being connected to a capacitor;
first current-mirror circuit means connected between said power source and the collector electrode of the other of the pair of transistors, said first current-mirror circuit means being coupled to the base electrode of the other of the pair of transistors through a first resistor and also coupled to charge the capacitor during intervals while the other of the pair of transistors is conductive;
second current-mirror circuit means connected between said power source and the collector electrode of said one of the pair of transistors;
third current-mirror circuit means connected between said second current-mirror circuit means and ground, said third current-mirror circuit means being coupled to the base electrode of the other of the transistors through a second resistor and also coupled to discharge the capacitor during intervals while said one of the pair of transistors is conductive;
bias circuit means connected between said power source and ground, said bias circuit means being coupled to the base electrode of the other of the pair of transistors through a third resistor;
a third transistor connected between the emitter electrodes of said pair of transistors and ground, and means responsive to a control voltage for controlling the current through the third transistor and therefore through said pair of transistors, whereby an oscillating frequency is controlled by a charging current to and a discharging current from the capacitor.

3,886,486
OSCILLATOR CIRCUIT FOR GENERATING AN OUTPUT SIGNAL HAVING SUCCESSIVE CYCLES WHICH UNIDIRECTIONALLY VARY IN FREQUENCY

Harry L. Maddox, Reynoldsburg, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,082
Int. Cl. H03k *3/28*
U.S. Cl. 331—111 **20 Claims**



2. In a circuit for generating an output signal the successive cycles of which vary in frequency:
an electrical storage device for cyclically receiving a charge and for generating successive cycles of the output signal having a potential in accordance with the charge stored therein;
means for cyclically changing the charge on the electrical storage device at a controlled rate from a first predeter-

mined level of charge to a second predetermined level of charge, and

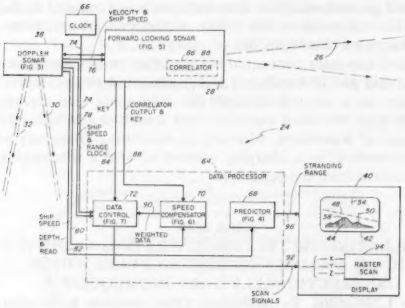
a control circuit, operative upon the charge on the electrical storage device reaching the second predetermined level of charge for changing the charge thereon to the first predetermined level of charge and for unidirectionally varying the rate at which the means for cyclically changing the charge changes the charge on the electrical storage device from the first to the second predetermined levels of charge.

3,886,487

ANTI-COLLISION SONAR SYSTEM

George M. Walsh, Middletown; James W. Cummings; William R. Backman, Jr., both of Portsmouth, and Clifford, Peter J., Barrington, all of R.I., assignors to Raytheon Corporation, Lexington, Mass.

Filed May 31, 1973, Ser. No. 365,819
Int. Cl. G01s *9/68*
U.S. Cl. 340—3 R **25 Claims**



1. A sonar system comprising:

a transducer system;

means for positioning said transducer system between two boundaries of a layer of fluid, said transducer system including means for adapting said transducer system to produce a beam of radiant energy wherein the sides of the beam are substantially parallel to said boundaries, said positioning means including means for rotating a beam of energy emanating from said transducer system for directing said beam of radiation between said boundaries; and means responsive to a speed of movement of said transducer system through said fluid for storing data obtained through the reception of radiant energy by said transducer system.

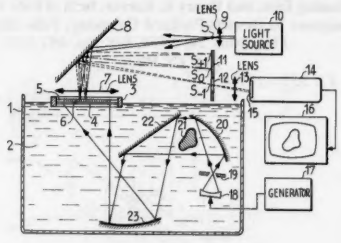
3,886,488

SYSTEM FOR THE REAL TIME VISUALIZATION OF ULTRASONIC IMAGES

Jean Bossaert; Joel Ernvein, and Erich Spitz, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 1, 1973, Ser. No. 356,140
Claims priority, application France, May 5, 1972, 72.16106
Int. Cl. G01s *9/66*; **G01n** *29/04*
U.S. Cl. 340—5 MP **14 Claims**

1. Ultrasonic image conversion system for the real time visualization of an ultrasonic image constituted by a two dimensional distribution of ultrasonic vibrational amplitudes, said system comprising: a vibrating diaphragm positioned for receiving said ultrasonic image, a thin liquid layer overlaying said diaphragm and having a reflective free surface, a periodic array of masking elements extending parallel beneath said free surface for inducing along said free surface a grating of ripples having the pitch of said periodic array, illuminating means for supplying incoherent optical radiation to said free surface, and optical imaging means forming an image of said free surface by selectively receiving at least one of the distinct portions of said incoherent optical radiation diffracted by said grating;



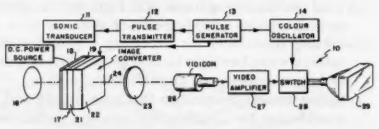
said illuminating means comprising a field lens and a source of incoherent electromagnetic radiation arranged in the focal plane of said lens.

3,886,489

ULTRASONIC IMAGE CONVERTER AND SYSTEM

Charles H. Jones, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1974, Ser. No. 445,525
Int. Cl. G01s *9/68*
U.S. Cl. 340—5 MP **10 Claims**



1. A system for converting sonic energy patterns into optical images comprising:

A. means for transmitting pulses of sonic energy to sonify an area;

B. means for focusing any sonic energy reflected from said sonified area;

C. means for converting said focused sonic energy to a visual image and comprising a unitized solid-state array including:

a. a transparent supportive substrate;

b. a transparent conductive film deposited on said substrate;

c. a layer of electroluminescent material deposited on said film;

d. an array of N spaced apart conductive pads deposited on said layer;

e. an array of N spaced apart amplifiers, each of said amplifiers having a pair of electrical contact elements, one said pair being in electrical contact with an associated conductive pad, and each of said amplifiers having electrical connector means adapted for connection to a power source;

f. an array of N spaced apart piezoelectric transducers, each of said transducers being in electrical contact with the other of said pair of electrical contact elements on an associated amplifier;

g. a second electrical conductive film positioned over said array of transducers and in electrical contact therewith; and

h. a low loss protective covering deposited over said second conductive film;

D. lens means for focusing said optical output;

E. a television camera tube positioned to receive all of said focused optical output and provide a video signal; and

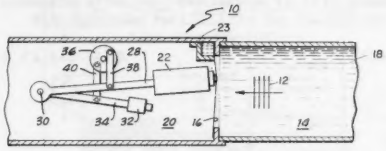
F. means electrically connected to said camera for visually displaying said video signals.

3,886,490

APPARATUS FOR COUPLING AN ARRAY OF ULTRASONIC TRANSDUCERS TO AN ULTRASONIC COMPRESSIONAL IMAGE FIELD AND SCANNING THE IMAGE FIELD

Philip S. Green, Redwood City, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed May 25, 1973, Ser. No. 363,876
Int. Cl. H04b *11/00*
U.S. Cl. 340—5 MP **7 Claims**



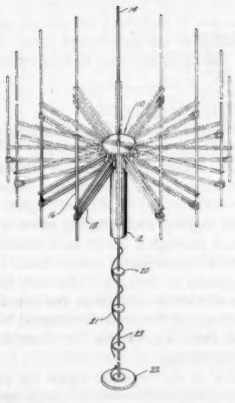
1. In a system for providing a visual representation of a compressional acoustic image field traveling in a fluid medium, an acoustically transparent window located in the path of said compressional acoustic image field and acting to contain said fluid, a transducer array located on the opposite side of said window from said fluid medium and in intimate contact with the said window, whereby the said compressional acoustic image field impinges upon said transducer array and is translated into electrical energy, and a thin layer of coupling liquid on the side of the said window contacted by the said transducer array.

3,886,491

EXPANDABLE SONAR ARRAY

Loren M. Jonkey, Burbank, and Eugene Markus, North Hollywood, both of Calif., assignors to The Bendix Corporation, North Hollywood, Calif.

Filed Sept. 12, 1973, Ser. No. 396,977
Int. Cl. H04b *13/00*
U.S. Cl. 340—9 **7 Claims**



6. In a vehicle-borne sonar system wherein a transducer array is reeled into and out of a body of water at the end of a cable, said array comprising:

a housing fastened to said cable containing electronic equipment, a plurality of deployable projector elements, means deploying said projector elements, and means connecting said projector elements together and to said electronic equipment;

a plurality of hydrophone staves attached to said housing, each stave attachment including a parallelogram linkage wherein one link thereof includes part of an associated stave, said linkage when retracted positioning itself and its associated stave against said housing and when extended supporting said stave a substantial distance outwardly from said housing, a length of each said stave being folded against said housing when said linkages are retracted, and means for rotating said length into axial alignment with the remainder of said stave when said staves are deployed such that each said stave is longer than said housing, said linkages and staves being positively buoyant in water; and

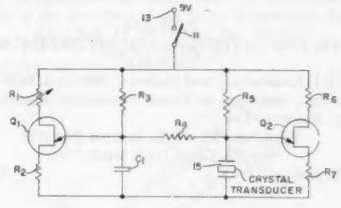
means securing said linkages against said housing until released at a desired depth of said transducer array.

3,886,492

SONIC INSECT REPELLER

Herbert Montgomery White, Carleton Place, Ontario, Canada, assignor to John Joseph Szmigielski, Ontario, Canada, a part interest

Filed Oct. 10, 1972, Ser. No. 296,075
Claims priority, application Canada, Oct. 7, 1971, 124720
Int. Cl. H04b *11/00*
U.S. Cl. 340—15 **8 Claims**



1. A sonic insect repeller comprising oscillator means including a unijunction transistor coacting with a BC circuit for generating an output signal with a sawtooth waveform having a fundamental frequency and having substantially higher harmonics, said signal including noise components at frequencies substantially higher than said fundamental frequencies and occurring only at the peaks of said sawtooth waveform, means for cyclically varying said fundamental frequency over a selected range, and a transducer for converting said signal into a sonic waveform.

3,886,493

ADAPTIVE MONOFREQUENCY PILOT SIGNALS

John B. Farr, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

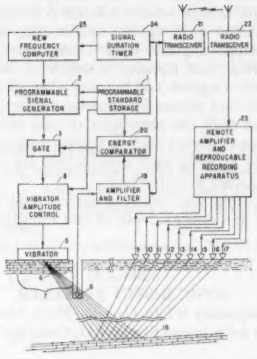
Filed May 7, 1973, Ser. No. 358,187
Int. Cl. G01v *1/14, 1/26*
U.S. Cl. 340—15.5 TD **18 Claims**

1. In a seismic prospecting method of the type where seismic waves are radiated into the earth from an electronically controllable multifrequency seismic source, the improvement comprising:

a. detecting said seismic waves on a near-field detector located near said seismic source, said near-field detector producing a near-field electrical signal corresponding to the said radiated seismic waves;

b. comparing a function of said near-field electrical signal with only a part of a predetermined multifrequency control signal; and

c. automatically modifying at least one of the duration, frequency or amplitude characteristics of said multifre-



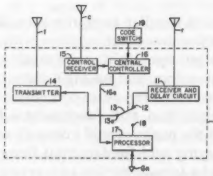
quency control signal when said comparison in step (b) indicates a predetermined ratio thereof has been reached.

3,886,494

SYSTEM FOR GATHERING AND RECORDING SEISMIC SIGNALS

Richard J. Kostelnicek, and Haines C. Hibbard, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Nov. 13, 1972, Ser. No. 306,096
Int. Cl. G01v *1/22*; H04b *7/14*
U.S. Cl. 340—15.5 TS **30 Claims**



16. For use in a seismic surveying system for deriving indications of seismic energy, apparatus comprising:

radio frequency receiver means for receiving coded signals which include seismic data signals successively occurring at regular time intervals with no two successive data signals having the same frequency;

first means for separating the frequency components of said coded signals and applying the resulting signals on separate signal channels;

second means for converting the signals in said channels into discrete time signals and for delaying said discrete time signals by a predetermined time interval; and

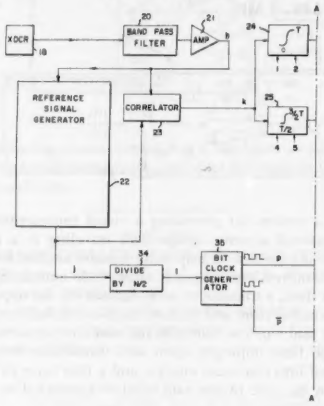
third means including radio frequency transmitter means connected to said second means for producing radio frequency signals of different frequencies dependent on the channel from which a delayed time signal is received thereby such that the signal is of the same frequency as the radio frequency signal applied to the channel.

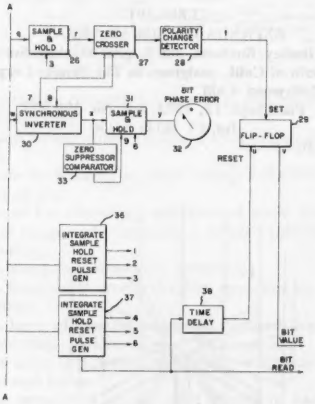
3,886,495

UPHOLE RECEIVER FOR LOGGING-WHILE-DRILLING SYSTEM

James H. Sexton, Duncanville, and Bobbie J. Patton, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 341,014, March 14, 1973, abandoned. This application July 10, 1974, Ser. No. 487,847
Int. Cl. G01v *1/40*
U.S. Cl. 340—18 LD **19 Claims**





1. In a system for logging-while-drilling wherein an acoustic signal is propagated through a liquid each from a downhole transmitter and the acoustic signal is modulated between two phase states in response to digitally coded data bits produced as a function of a downhole condition, and representation of each bit being propagated for a predetermined bit time interval, an improved receiving system for demodulating said acoustic waves comprising:

means responsive to the acoustic signal for producing an output signal representative of the phase and frequency of said acoustic signal,

a reference signal generator responsive to said output signal for producing a reference signal having one phase state, that being one of the phase states of said output signal,

a correlator, said output signal and said reference signal being applied to said correlator to produce a synchro-

nously rectified signal whose polarity is representative of the phase states of said output signal, and

means responsive to said reference signal for sampling said synchronously rectified signal to produce pulses representative of the generated bits and thus of the downhole condition.

3,886,496

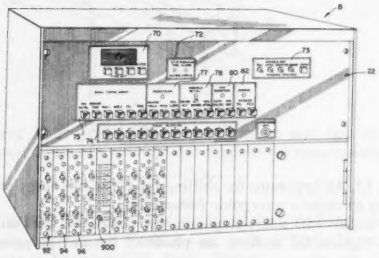
TRAFFIC CONTROLLER EMPLOYING A DIGITAL COMPUTER

Richard A. Spilo, Davenport, Iowa; Frank W. Hill, Moline, and Larry O. Hoffman, Rockford, both of Ill., assignors to Gulf & Western Industries, Inc., New York, N.Y.

Continuation of Ser. No. 289,312, Sept. 14, 1972, abandoned. This application Feb. 20, 1974, Ser. No. 444,122

Int. Cl. G08g *1/00*

U.S. Cl. 340—41 R **45 Claims**



1. In a controller for controlling traffic signals displayed to at least two conflicting movements of traffic through an intersection, said controller including a memory unit to store at separate addresses, separate binary codes each representing a numerical value for use in a selected function of said controller, the improvement comprising: a switching network for manually selecting, from one of said addresses, one of said codes for a selected function; means for decoding said selected code to produce display numerals corresponding to the numerical value at said one address; a visual display means for displaying said display numerals; means for manually changing said display numerals displayed by said visual display means to a new value; means for providing a new code corresponding to said new value; and, means for then storing said new code in said memory unit at said one address.

3,886,497

WAVEGUIDE CIRCULATOR HAVING SINGLE GYROMAGNETIC ELEMENT

Joseph Helszajn, Edinburgh, Scotland, assignor to Microwave Development Laboratories, Inc., Needham-Heights, Mass.

Filed Mar. 15, 1974, Ser. No. 451,510

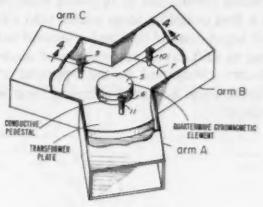
Claims priority, application United Kingdom, Mar. 26, 1973, 14566/73

Int. Cl. H01p *1/32*

U.S. Cl. 333—1.1 **4 Claims**

1. In a three-port waveguide circulator of the type having
1. three waveguide arms meeting at a common junction,
2. an electrically conductive pedestal situated at the junction and extending into the junction from one waveguide wall,
3. a gyromagnetic element mounted on the pedestal with one face of the gyromagnetic element short-circuited by the pedestal and the other face spaced from the opposite waveguide wall by a dielectric gap, and
4. means to establish a magnetic field of an intensity that affects the gyromagnetic action of the gyromagnetic element, the improvement wherein

a. the gyromagnetic element is centrally situated at the waveguide junction and is substantially one quarter wavelength long at a frequency within the operational band of the circulator, the wavelength being the length in the guide, and the one quarter wavelength being



measured at the junction along the extended longitudinal axis of a waveguide arm, and

b. the pedestal extends from an impedance transformer plate disposed upon said one wall, the impedance transformer plate effecting a reduction in the internal height of the waveguide.

3,886,498

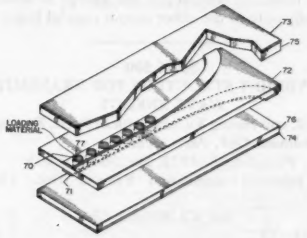
WIDEBAND, MATCHED THREE PORT POWER DIVIDER

Joseph A. Mosko, and Robert G. Corzine, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 22, 1974, Ser. No. 490,433

Int. Cl. H01p *5/12*

U.S. Cl. 333—9 **6 Claims**



1. A power divider comprising;
electrically conducting coupling lines;
an electrically insulating material separating said coupling lines;
said coupling lines being mutually overlapping over a portion of the total length of the lines; and
microwave loading means in said insulation material in the portion thereof only in the mutually overlapping region, defined by said coupling lines.

3,886,499

HIGH FREQUENCY ELECTRICAL NETWORK WITH FREQUENCY DEPENDENT CHARACTERISTICS HAVING A CONSTANT INPUT RESISTANCE

Ronald Hutchinson, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, Essex, England

Filed Aug. 3, 1973, Ser. No. 385,291

Claims priority, application United Kingdom, Aug. 5, 1972, 36665/72

Int. Cl. H01p *5/14*

U.S. Cl. 333—10 **10 Claims**

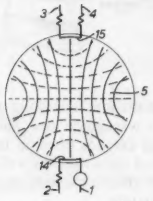
1. A constant resistance electrical network comprising in combination:

a cavity resonator;

a pair of separate couplers disposed within said cavity resonator in electrically insulated relation thereto, and each coupler having the same characteristic resistance;

a first input coaxial line and a first output coaxial line leading to said cavity resonator and each having a center conductor connected to opposite ends of one coupler to form a first coupling loop within said cavity resonator;

a second input coaxial line and a second output coaxial line leading to said cavity resonator and each having a center conductor connected to the opposite end of the other coupler to form a second coupling loop within said cavity resonator;



each coupling loop being disposed in a plane transverse to the natural direction of propogation of resonant waves excited within the cavity resonator by said couplers and means terminating each of said output coaxial lines in said characteristic resistance, whereby when energy is applied to either input coaxial line none is reflected thereby and the energy is directed substantially only to the corresponding output coaxial line except when the energy is substantially at the resonant frequency of said cavity resonator whereupon the energy is directed substantially only to the other output coaxial line.

3,886,500

FLAT HYBRID-T STRUCTURE FOR TRANSMITTING WAVE ENERGY

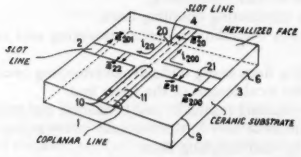
Michel Baril, and Hoang Vu San, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 5, 1973, Ser. No. 422,103

Claims priority, application France, Dec. 12, 1972, 72.44176

Int. Cl. H01p *5/12*

U.S. Cl. 333—11 **5 Claims**



1. A flat hybrid-T structure comprising a dielectric substrate having a metallized face provided with two throughgoing, intersecting gaps forming a first, a second, a third and a fourth channel meeting at the point of intersection and constituting transmission lines for the propagation of wave energy, said first and fourth channels being mutually decoupled for said wave energy and forming part of one of said gaps, said first channel being a coplanar line, said fourth channel being a slot line decoupled from said coplanar line for said wave energy, said second and third channels being part of the other of said gaps and being of the same structure as one of the channels of said one of said gaps to form with said first and fourth channels a shunt junction and a series junction, respectively, and input means for connecting a source of wave energy to one of said lines.

3,886,501

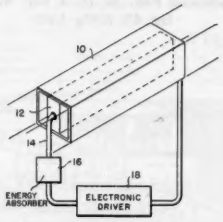
INSERTION AND DIFFERENTIAL PHASE-TRIM METHOD

Louis J. Lavedan, Jr., Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 3, 1974, Ser. No. 475,719

Int. Cl. H01p *1/32*

U.S. Cl. 333—24.1 **14 Claims**



13. An apparatus for shifting the phase of energy propagating through a waveguide comprising:

means with a ferrimagnetic core positioned with said waveguide for shifting the phase of the energy propagating therein;

electrical driving means coupled by a conductor to said phase-shifting means for generating a voltage pulse and applying it by way of said conductor to said phase-shifting means to set its phase shift characteristics; and

energy-absorption means external to said waveguide and surrounding a portion of said coupling conductor for absorbing energy from said voltage pulse as it is applied through said conductor to drive said phase-shifting means in order to decrease the phase-shift characteristics of said phase-shifting means to approximate a predetermined value or set of values.

3,886,502

BROAD BAND FIELD DISPLACEMENT ISOLATOR

Herbert P. Radding, Newark, and George E. Tralle, Los Altos, both of Calif., assignors to RYT Industries, Santa Clara, Calif.

Filed Aug. 6, 1974, Ser. No. 495,284

Int. Cl. H01p *1/32*

U.S. Cl. 333—24.2 **8 Claims**

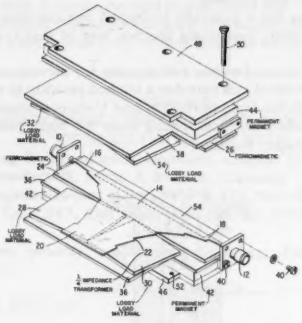
1. A broad band microwave strip-line field displacement isolator comprising:

a conductive planar circuit having three outwardly narrowing legs extending from a common portion with a first and a second of said legs being an input port and an output port respectively, said circuit being symmetrical with respect to an axis extending through said third leg and at least the edge of said circuit extending between and joining said first and said third legs and the edge of said circuit extending between and joining said second and said third legs constituting a series of stepped λ/4 linear tapered impedance transformers;

first and second bodies of gyromagnetic material symmetrically disposed on opposite sides of said conductive circuit and overlying substantially the entire portion of said circuit extending between said input and output ports;

first and second layers of a dielectric load material disposed on opposite sides of said circuit overlying said third leg and coplanar with said first and second bodies of gyromagnetic material respectively;

first and second spaced parallel ground planes overlying said first and second bodies of gyromagnetic material and said first and second layers of load material respectively; and



magnetic field generating means adjacent said first and second layers of gyromagnetic material for biasing same.

3,886,503

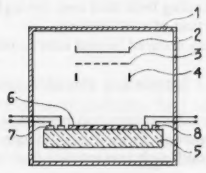
DEVICE FOR STORING HIGH FREQUENCY SIGNALS

Alain Bert, and Gerard Kantorowicz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 28, 1974, Ser. No. 437,602

Int. Cl. H03h *9/30;* **G11c** *21/02, 27/00*

U.S. Cl. 333—30 R **2 Claims**



1. A device for storing travelling surface waves comprising, inside a vacuum tight enclosure; a delay line of strongly piezoelectric material having transducers mounted thereon and separated from one another, for transducing high frequency electric signals into acoustic waves and vice-versa, said acoustic waves propagating along a work surface of said line between said transducers; and an electron gun for directing a beam of primary electrons toward said work surface; said work surface of said delay line being covered with a thin layer of electrically insulating material; and said thin layer having deposited on it a plurality of bands parallel to the direction of acoustic wave travel along said line, said bands being made of a material having a high coefficient of secondary emission.

3,886,504

ACOUSTIC SURFACE WAVE RESONATOR DEVICES

Clinto Sylvester Hartmann, and Ronald Carl Rosenfeld, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 20, 1974, Ser. No. 471,616

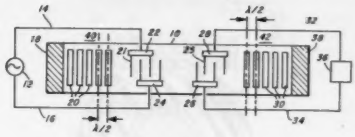
Int. Cl. H03h *9/26, 9/30;* **H01v** *7/00*

U.S. Cl. 333—72 **20 Claims**

1. A surface wave resonator device comprising:

substrate means having at least a surface layer of piezoelectric material.

acoustic surface wave transducer means disposed on said piezoelectric surface of said substrate means and being operable to convert an input electrical signal to acoustic surface waves propagating on said piezoelectric surface of said substrate means, and



means defining first and second reflective grating structures on the piezoelectric surface of said substrate means on opposite sides of said acoustic surface wave transducer means and being responsive to acoustic surface waves generated thereby to provide at least one region on the piezoelectric surface of said substrate means wherein a standing wave resonance condition occurs.

3,886,505

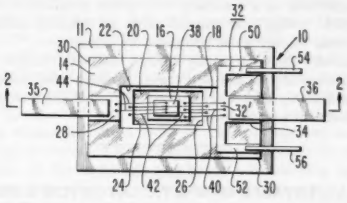
SEMICONDUCTOR PACKAGE HAVING MEANS TO TUNE OUT OUTPUT CAPACITANCE

David Stanley Jacobson, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1974, Ser. No. 464,944

Int. Cl. H01p *1/00*

U.S. Cl. 333—84 M **6 Claims**



1. A high frequency semiconductor device comprising:

an envelope,

a transistor chip mounted within said envelope,

first, second, and third terminals electrically connected to different portions of said chip,

said first and said second terminals providing means whereby an electrical signal can be introduced into said device, and said second and said third terminals providing means whereby an electrical signal can be extracted from said device,

said third terminal extending exteriorly from said envelope and serially connected to said chip through a first inductance within said envelope, and

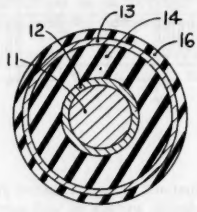
a fourth terminal separate from said second terminal extending exteriorly from said envelope and serially connected through a second inductance within said envelope to a point of junction between said third terminal and said first inductance.

3,886,506

MAGNETICALLY ENHANCED COAXIAL CABLE WITH IMPROVED TIME DELAY CHARACTERISTICS

Harold Lorber, Dresher, and Irving Duboff, West Chester, both of Pa., assignors to Hilabs Company, Wilmington, Del.

Filed Mar. 5, 1973, Ser. No. 338,335
Int. Cl. H01p 3/06; H01b 11/14
U.S. Cl. 333—96 16 Claims



1. In a communication system having means for generating high frequency electro magnetic energy pulses representing intelligence, a coaxial cable for transmitting said pulses, and means for receiving said pulses, said cable comprising in combination:

an electrical center conductor,

a magnetizable material at the outside surface of said center conductor,

said magnetizable material being magnetically oriented to provide a magnetic field which is substantially circumferentially around said center conductor.

electrically insulating dielectric material disposed to cover said center conductor,

an electrical outer conductor formed to provide a shield around said dielectric material,

said center conductor, said outer conductor, and said dielectric material disposed together to form said coaxial cable,

said magnetizable magnetic material being magnetically oriented in a direction to provide a sufficient magnetic field within said coaxial cable to enhance electro magnetic energy pulse propagation velocity,

whereby high frequency electro magnetic pulses from the generating means will travel through said coaxial cable means to said receiving means faster than would occur without said magnetic field.

3,886,507

ADJUSTABLE MAGNETIC LATCH FOR A RELAY

Robert J. Johnston, and Alfred E. Maier, both of Beaver Falls, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1973, Ser. No. 404,058
Int. Cl. H01f 7/08
U.S. Cl. 335—234 7 Claims

1. A latch comprising:

a housing formed of a magnetizable material;

an elongated core formed of a magnetizable material disposed within said housing and being movable between a latched position wherein said core is in contact with said housing and an unlatched position wherein said core is not in contact with said housing;

a magnet disposed within said housing between said housing and said core so as to form a magnetic circuit through said core and said housing when said core is in contact with said housing to securely hold said core to said housing;

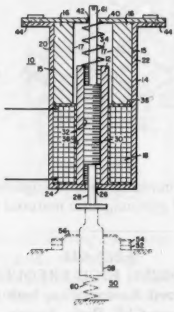
said magnet disposed with the north-south pole of said magnet aligned substantially perpendicular to the longitudinal axis of said core;

biasing means for biasing said core towards the latched position;

an electric coil, disposed in said housing, which when energized opposes the magnetic circuit formed through said core by said magnet permitting said core to be moved to the unlatched position;

said housing has a generally U-shaped cross-section with a bight portion connecting the two legs of said U-shaped housing;

said core disposed within said housing for movement along its longitudinal axis between a latched position in engagement with the bight portion of said U-shaped housing and an unlatched position spaced from the bight portion of said U-shaped housing;



an end plate formed from non-magnetic material connecting the free ends of the legs of said U-shaped housing;

said housing having an opening formed in the bight portion;

a latch arm extending from said core through the opening in the bight portion of said housing;

said latch arm being secured to said core to move in unison with said core;

said core having a longitudinal threaded opening formed therein; and

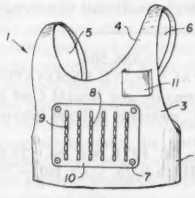
said latch arm includes a threaded portion which engages the threaded opening formed in said core so that the distance which said latch arm extends from said latch can be varied.

3,886,508

MAGNETIC TOOL HOLDER

Georges Louis Lavrard, Chatellerault, France, assignor to S. A. Manufacture d'Armes et Cycles de Chatellerault, Chatellerault, France

Filed May 13, 1974, Ser. No. 469,405
Claims priority, application France, May 15, 1973, 73.17835
Int. Cl. H01t 7/20
U.S. Cl. 335—285 10 Claims



1. A tool holder comprising:

a. a support having a face;
b. a group of permanent magnets on said face,
1. each magnet being not farther than 2 inches from another magnet of said group,
2. said magnets jointly defining an accessible engagement surface having dimensions of length and width greater than 2 inches parallel to said face; and
c. fastening means for fastening said support to a portion of an adult human body remote from the hands of said body.

3,886,509

ADJUSTABLE INDUCTION COIL FOR ZONE MELTING OF SEMICONDUCTOR RODS

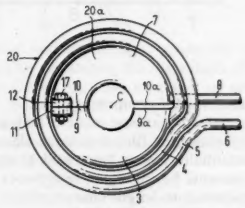
Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 309,420, Nov. 24, 1972, Pat. No. 3,827,017. This application Jan. 23, 1974, Ser. No. 435,837

Claims priority, application Germany, Feb. 1, 1973, 2304974

Int. Cl. H01f *27/28*

U.S. Cl. 336—62 **4 Claims**



1. An induction heating coil for use in crucible-free zone melt treatment of semiconductor rods comprising a current conducting loop of at least a single turn arranged in a given plane and an insert member extending radially inwardly from said turn, said insert member being composed of at least two annularly shaped portions, one of said portions being permanently attached to said conductive loop, and the other of said portions being permanently attached to a terminal to form a conductive path, each of said portions having an end face in contact with an adjacent end face of another portion, said end faces of the portions being disposed perpendicularly to said plane of the turn, fastening means separably attaching said end faces, and a conduit forming a conductive path through said conducting loop and said annularly shaped portions of said insert for guiding a heat exchange medium therethrough.

3,886,510

HIGH-VOLTAGE INDUCTIVE COIL

Robert E. Canup, Chester, and Earl W. McPeak, Jr., Powhatan, both of Va., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 22, 1973, Ser. No. 390,474

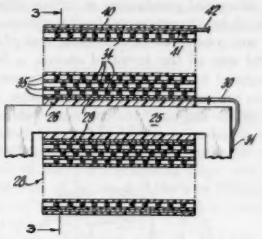
Int. Cl. H01f *27/28*

U.S. Cl. 336—70 **12 Claims**

1. High-voltage AC inductive coil, comprising in combination

a large plurality of winding turns beginning at the inside of said coil and including multi-turn layers of an electrical conductor for developing a high-voltage output,

the first turn of said winding turns comprising a unitary strip having a beginning and an ending and extending laterally substantially the entire width of said multiturn layers, said ending overlapping said beginning and being insulated at said area of overlap, and



means for connecting a lead conductor to said beginning of the first turn.

3,886,511

SELF-RESTORING CURRENT LIMITING DEVICE

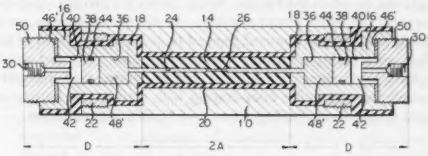
Toshio Miyamoto; Yuichi Wada; Suenobu Hamano; Teijiro Mori; Takeo Inoue, and Takashi Shirasawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 24, 1974, Ser. No. 436,385

Claims priority, application Japan, Jan. 25, 1973, 48-10421; Aug. 24, 1973, 48-94996

Int. Cl. H01h *87/00*

U.S. Cl. 337—119 **6 Claims**



1. A self-restoring current limiting device, comprising;

a metallic shell having first and second ends; an electric insulator surrounded by and in contact with the inside of said shell and having an opening extending from said first to said second end; a body of current limiting material filling said opening, said material being in a selected one of original, solid and liquid states at room temperature, being responsive to a flow of electric current therethrough in excess of a predetermined magnitude by evaporation of the material, and being self-restoring to its original state when the excess current terminates;

a current terminal block including pressure release means for releasing a pressure of evaporated current limiting material, said pressure release means including a compartment communicating with said opening and filled with an additional amount of current limiting material; a movable piston defining one side of said compartment; and

means for applying a back pressure to said piston.

3,886,512

SPRING AND SHUNT ASSEMBLY FOR CIRCUIT INTERRUPTER

Frank L. Cameron, North Huntingdon, and Robert C. Iandola, Langhorne, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

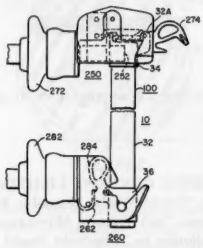
Filed May 15, 1974, Ser. No. 470,105

Int. Cl. H01h *71/10*

U.S. Cl. 337—178 **10 Claims**

1. A high voltage circuit interrupter comprising a tubular insulating holder, a body of arc extinguishing material dis-

posed inside of and spaced from the ends of the holder and including at least one passageway extending axially therethrough, terminal means disposed adjacent to each end of the holder, an elongated conducting member disposed to extend axially through said passageway, fusible means disposed inside the holder and connected between one end of the conducting member and one of the terminal means, a first conducting member secured to the other terminal means and having a main portion projecting axially into the holder, a spring holder member slidably disposed on the main portion of the first conducting member, a spring connected between the other end of the elongated conducting member and said spring



holder member, a flexible helically coiled conductor connected between the main portion of the first conducting member and the other end of the elongated conducting member, and means movably mounted on the first conducting member and coupled to the spring holder member to be actuated by said spring when the fusible means blows for projecting axially beyond the other terminal means, an elongated tubular spring guide attached at one end thereof to said main portion of said first conducting member, said spring being disposed axially within said elongated tubular spring guide, said elongated tubular spring guide cooperating with said spring to prevent said spring from fouling when said fusible means blows.

3,886,513

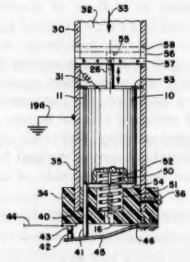
DE-ENERGIZING SYSTEM FOR THERMAL ACTUATOR

Lynn C. Smith, Willoughby Hills, and Richard G. Huebscher, Mayfield Village, both of Ohio, assignors to Gould Inc., Willoughby, Ohio

Filed Nov. 27, 1973, Ser. No. 419,269

Int. Cl. H01h *37/44*

U.S. Cl. 337—315 **13 Claims**



1. A de-energizing system for a thermal actuator that includes a casing in which a variable volume chamber is defined, a piston movably positioned in said casing, and a thermally expansible material in said chamber that increases pressure therein to move the piston when said thermal actuator is energized, said thermal actuator producing an output force in response to an energy input, comprising a support; means for movably supporting said thermal actuator relative to said support; means for selectively coupling said thermal actuator for energization from an energy source; and means responsive to an overload condition of said thermal actuator for de-energizing the same, said means for de-energizing being responsive to movement of said thermal actuator relative to said support upon occurrence of an overload condition and also being operatively coupled to said means for selectively coupling for controlling the same to de-energize said thermal actuator.

3,886,514

VARIABLE RESISTOR

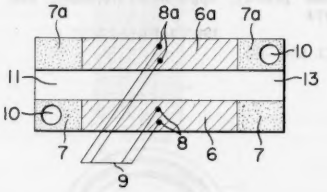
Shunzo Oka, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 6, 1973, Ser. No. 338,583

Claims priority, application Japan, Mar. 10, 1972, 47-24906

Int. Cl. H01c *9/02*

U.S. Cl. 338—126 **4 Claims**



1. A variable resistor comprising

a. a substantially planar base made of an insulating material,

b. a pair of elongated film resistance elements formed on the substantially planar base, said elongated film resistance elements having equal resistances and having the same resistance-to-length characteristics and equal temperature coefficients of resistance,

c. a wiper arm electrically and mechanically bridging sais pair of film resistance elements and movably arranged to slide from one end of the pair of elements to the other while maintaining electrical contact therewith,

d. a first terminal on said planar base and electrically connected to one end of said pair of film resistance elements,

e. a second terminal on said planar base electrically connected to the other of said pair of film resistance elements on an end of the pair of resistance elements opposite the end to which the first terminal is connected,

f. whereby movement of said wiper arm from one end of the pair of resistance elements to the other increases the electrical resistance between the wiper arm and one of the terminals and decreases the resistance between the wiper arm and the other terminal, said increase in electrical resistance being substantially equal to said decrease, and

g. said terminals being electrically connected solely through said film resistance elements and said wiper arm.

3,886,515

AUTOMATIC VEHICLE-MONITORING SYSTEM

Jean Cottin, and Jean Laxaque, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 24, 1973, Ser. No. 363,729

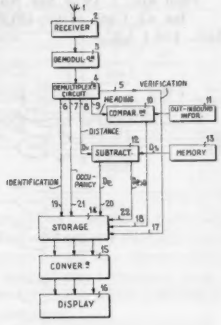
Claims priority, application France, May 26, 1972, 72.18883

Int. Cl. G08g *1/12*

U.S. Cl. 340—23 **15 Claims**

1. A system for automatically monitoring a plurality of surface vehicles equipped with transmitting means for intermittently sending out messages including positional data indicating the distance Dv of the vehicle, along a predetermined route, from a fixed reference point common to all vehicles, comprising:

receiving means located at a transit point along the route of said vehicles for picking up the transmitted messages;
data-supply means at said transit point for indicating the distance Ds thereof from said reference point;
data-supply means at said transit point connected to said receiving means and to said arithmetic means for calculating from said distances Dv and Ds the sign and magnitude of the instantaneous distance De of the vehicle from said transit point;



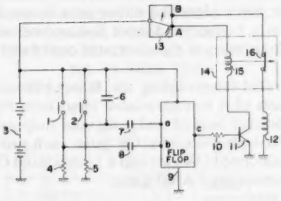
storage means at said transit point connected to said arithmetic means for registering the magnitude of the vehicular distance De in response to a sign of said vehicular distance De indicating that the vehicle is approaching said transit point; and
output means connected to said storage means for revealing the approach of a vehicle.

3,886,516

SEAT BELT OPERATION DETECTOR

Masaru Itoh, and Kosaku Uota, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed July 17, 1973, Ser. No. 380,005
Claims priority, application Japan, July 25, 1972, 47-74507
Int. Cl. B60r *21/10*
U.S. Cl. 340—52 E **4 Claims**



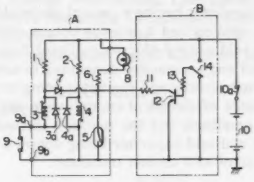
1. A seat belt operation detector for a vehicle having an engine comprising:
a seat switch which is normally open but which closes when a seat in the vehicle is occupied,
a belt switch which is normally open but which closes when a seat belt in the vehicle is utilized.
a flip-flop having first and second inputs and output and which generates a first predetermined signal from its output when a first signal is applied to its first input and which generates a second predetermined signal from its output when a second signal is applied to its second input,
means for starting the vehicle engine responsive to the first predetermined signal to prohibit the engine from starting and responsive to the second predetermined signal to permit the engine to start,
means connecting the seat switch between the first input of the flip-flop and a power source,
means connecting the belt switch between the second input of the flip-flop and a power source, and
means connecting the output of the flip-flop to the means for starting the vehicle engine.

3,886,517

VEHICLE FAULT DETECTING AND INDICATING SYSTEM

Toshikazu Ohtake, Okazaki; Koichi Taniguchi; Yasuhiko Sakurai, both of Kariya; Nobumasa Higo, and Jun Ohta, both of Toyota, all of Japan, assignors to Nippondenso Co., Ltd. and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Kariya-shi, Japan

Filed May 30, 1974, Ser. No. 474,859
Claims priority, application Japan, June 2, 1973, 48-62111
Int. Cl. G08b *19/00*
U.S. Cl. 340—52 F **8 Claims**



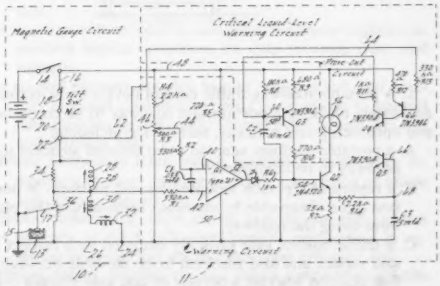
1. A fault detecting and indicating system comprising:
a fault detector for detecting a fault in an object of fault detection;
differential relay coil means having a first coil adapted to be deenergized when said fault detector detects a fault, and a second coil wound in a direction opposite to said first coil and normally energized;
means including a magnetic switching element whereby in response to a change of electromagnetic attraction caused by the deenergization of said first coil of said differential relay coil means, said magnetic switching element is turned on to short-circuit said first coil and provide a second energizing circuit; and
an indicator adapted to be actuated by said second energizing circuit to give an indication of fault.

3,886,518

CRITICAL LIQUID-LEVEL WARNING CIRCUIT

Michael Bozoian, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 4, 1974, Ser. No. 430,955
Int. Cl. G08b *21/00*
U.S. Cl. 340—59 **5 Claims**



1. A critical liquid-level warning circuit for association with a liquid-level indicating circuit coupled to a DC source of electrical energy through a switch, said indicating circuit

including a sensing device which provides a voltage which varies between upper and lower voltage limits as a function of a liquid level sensed by said sensing device, said critical liquid-level warning circuit comprising:

an operational amplifier having inverting and non-inverting inputs and having an output, said sensing device being coupled to one of said amplifier inputs to supply said sensing device voltage thereto;

means for providing a critical reference voltage to the other of said inputs to said operational amplifier;

an electrically actuable warning device;

a first transistor having a control electrode and having an output circuit, said first transistor output circuit being connected in series with said warning device and said first transistor control electrode being connected to the output of said operational amplifier;

a capacitor coupled to said output circuit of said first transistor, said capacitor being connected to accumulate a potential difference across it when said first transistor is in a conductive state corresponding to actuation of said warning device;

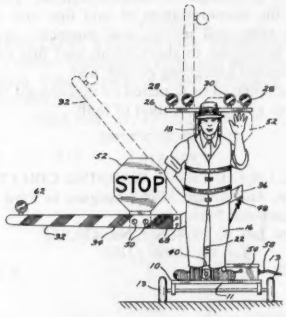
a second transistor having a control electrode and an output circuit, said second transistor output circuit being coupled to said control electrode of said first transistor; and a resistor and a capacitor connected in series, said series-connected resistor and capacitor being connected across said source of electrical energy when said switch is in a closed condition and the junction formed between said resistor and said capacitor being coupled to said control electrode of said second transistor.

3,886,519

PORTABLE TRAFFIC CONTROL DEVICE

Gilbert L. Hovland, Box 450K, Route 2, Wyoming, Minn. 55092

Filed June 27, 1974, Ser. No. 483,522
Int. Cl. B60q *1/00;* **E01f** *9/10;* **G09f** *7/00*
U.S. Cl. 340—135 **8 Claims**



1. A portable roadway traffic control device for selectively alternately blocking a portion of a roadway to be controlled and unblocking said roadway, said device including:

A. a portable platform adapted to be situated adjacent to a roadway to be controlled;

B. a replica of a person mounted on said platform in position to be observable by motorists approaching this platform along the roadway;

C. a traffic control gate pivotally mounted with respect to said replica and said platform to be movable between a first position wherein a portion of said gate extends over at least a portion of the roadway to be controlled and a second position wherein said gate is clear of said roadway;

D. power means to move said gate between said first and second positions; and

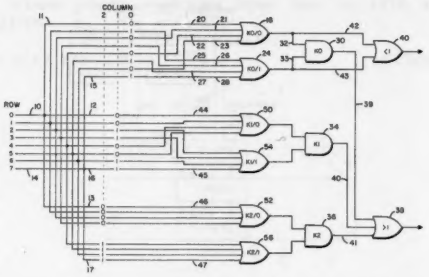
E. control means for controlling said power means.

3,886,520

CHECKING CIRCUIT FOR A 1-OUT-OF-N DECODER

Bruce A. Christensen, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 3, 1974, Ser. No. 457,669
Int. Cl. G06t *11/08;* **H03k** *13/34*
U.S. Cl. 340—146.1 AB **3 Claims**



1. A checking circuit for a 1-out-of-n binary decoder where $n = 2^K$, n being the number of decoder outputs 0 through n-1 that are to be checked on the associated n decoder output lines 0 through n-1 and n, K being positive integers wherein there is utilized for identification of the input lines associated therewith a binary table of n rows, 0 through n-1, and K columns, 0 through K-1, with a binary 0 or 1 entry at each of the nK row-column intersections, said checking circuit comprising:

nK separate input lines, said nK separate input lines arranged into K sets of n column-associated input lines and n sets of K row-associated input lines, each of said nK separate input lines associated with and identified by an associated one of said nK binary entries of said binary table for being identified either as a 0-associated input line or as a 1-associated input line as determined by the 0 or 1 binary entry at the associated one of said nK binary entries;

means parallel intercoupling the K input lines of each of said n sets of K row-associated input lines for receiving the associated ones of said n decoder outputs;

K pairs of column-associated OR gates, each pair comprised of a 0-associated OR gate and a 1-associated OR gate;

K column-associated AND gates;

a <1 OR gate;

a >1 OR gate;

means coupling the 0-associated input lines and the 1-associated input lines of each of said K sets of n column-associated input lines to the 0-associated OR gate and the 1-associated OR gate, respectively, of the associated pair of the K pairs of column-associated OR gates;

means coupling the outputs of each pair of the K pairs of column-associated OR gates to an associated one of the K column-associated AND gates;

means coupling the outputs of the K column-associated AND gates to said >1 OR gate for generating the >1 output signal only when two or more of said n decoder outputs are active;

means coupling the outputs of any pair of the K pairs of column-associated OR gates to said <1 OR gate for generating the <1 output signal only when none of said n decoder outputs is active.

3,886,521

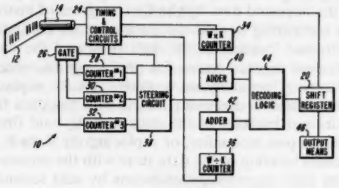
CODED RECORD AND METHODS OF AND APPARATUS FOR ENCODING AND DECODING RECORDS

Bruce W. Dobras, Dayton, Ohio, assignor to Monarch Marking Systems, Incorporated, Dayton, Ohio

Division of Ser. No. 239,168, March 29, 1972, Pat. No. 3,784,792. This application Nov. 16, 1973, Ser. No. 416,361

Int. Cl. G06f *11/10;* **G06k** *5/00*

U.S. Cl. 340—146.1 AG **7 Claims**



1. A system for interpreting a record encoded with a series of areas of alternate first and second characteristics in which groups of adjoining areas having like characteristics include plural data bits and at least one redundant code check bit determined with reference to the plural data bits in the same group, said system comprising:

an area-responsive reader,

size-evaluating means coupled to and controlled by the reader for sequentially determining the relative size of areas of the first characteristic in a group and for also separately determining the relative size of areas of the second characteristic in a group, said means including means for generating code values representing the results of each relative size determination for the areas of like characteristic within a group, and

decoding means accepting as an input code values supplied by said size-evaluating means for generating an error signal in response to the receipt of code values which do not correspond to the scanning of valid combinations of data and check bits having like characteristics.

3,886,522

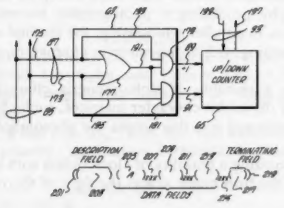
VOCABULARY AND ERROR CHECKING SCHEME FOR A CHARACTER-SERIAL DIGITAL DATA PROCESSOR

Robert S. Barton, Palo Alto; Erwin A. Hauck, Arcadia, and Don M. Lyle, Huntington Beach, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 28, 1974, Ser. No. 447,015

Int. Cl. G06f *11/00*

U.S. Cl. 340—146.1 AB **16 Claims**



1. Error checking means for use in a data processor in which data is commmunicated between various parts of the processor in the form of data structures, each data structure being comprised of a plurality of characters chosen from at least four possible types of characters and each data structure having a format such that the number of a first type of character contained in a data structure has a predetermined relation to the number of a second type of character contained in the data structure, said error checking means comprising:

input means to which the characters of a data structure are applied in a character-serial format,

first detecting means coupled to said input means for detecting the presence of first types of characters contained in an applied data structure,

second detecting means coupled to said input means for detecting the presence of second types of characters contained in an applied data structure, and

interpreting means including counting means coupled to said first and second detecting means and responsive to the detection of said first and second types of characters for providing an indication of the occurrence of an error based on the relative numbers of said first and second types of characters contained in the data structure.

3,886,523

MICRO PROGRAM DATA PROCESSOR HAVING PARALLEL INSTRUCTION FLOW STREAMS FOR PLURAL LEVELS OF SUB INSTRUCTION SETS

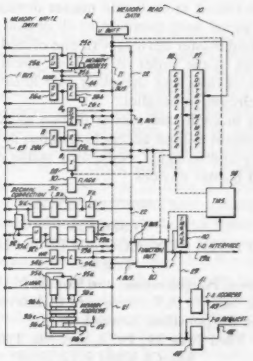
Alisdair Cullen Ferguson, Bathgate; John McGregor, Currie, and Alastair George MacPherson, Linlithgow, all of Scotland, assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 2, 1973, Ser. No. 402,747

Claims priority, application United Kingdom, June 5, 1973, 26717/73

Int. Cl. G06f *9/16*

U.S. Cl. 340—172.5 **21 Claims**



1. A data processing system having a micro instruction syllable memory portion and a processor, said processor comprising:

a plurality of general purpose registers to temporarily store data;

a function unit coupled to said general purpose registers to perform logical operations on data received from said registers;

a control memory coupled to said registers and said function unit and containing control instructions to control data transfers between said general purpose registers and said function unit;

micro instruction fetch means coupled to said micro instruction memory portion to fetch a sequence of micro instruction syllables;

control instruction fetch means coupled to said control memory to fetch individual control instructions in response to respective micro instruction syllables; and

timing means coupled to said micro instruction syllable fetch means and to said control instruction fetch means to cause a sequence of micro instruction syllables to be fetched from said micro instruction memory and a corre-

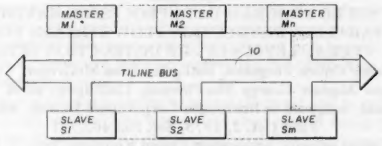
sponding sequence of control instructions to be fetched from said control instruction memory where the fetch of a particular control instruction for a preceding micro instruction syllable occurs concurrently with the fetch of the next micro instruction syllable in the sequence of micro instruction syllables.

3,886,524

ASYNCHRONOUS COMMUNICATION BUS

Daren R. Appelt, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 18, 1973, Ser. No. 407,761
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **11 Claims**



1. An asynchronous bus for self-determined priority of communication among master computer devices communicating with slave devices through said bus where a multi bit data channel and a multi bit address channel are time shared by all of said devices, which comprises:

a. a logic circuit in each said master device

b. three signal lines common to all of said logic circuits in all of said master devices with one of said lines connected in series in the order of assigned priority between said master devices and the other two lines connecting said logic circuits in parallel.

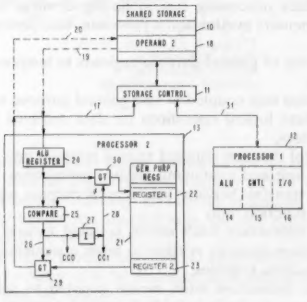
c. means in each said master device to actuate each said logic circuit to limit access to said bus in the order of said priority and to signal availability status of said bus to all of said master devices.

3,886,525

SHARED DATA CONTROLLED BY A PLURALITY OF USERS

Paul J. Brown, Poughkeepsie, and Ronald M. Smith, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1973, Ser. No. 375,224
Int. Cl. G06f *9/12, 9/18*
U.S. Cl. 340—172.5 **2 Claims**



1. In a data processing system which includes a plurality of users, each of which may require access to the same data in an addressed location of a data store for the purpose of processing the data accessed in accordance with a first program of instructions, apparatus associated with each of the users comprising:

register means, including a first register means for storing the data accessed from the addressed location and, a second register means for storing data resulting from the processing of the data in said first register by the first program; and

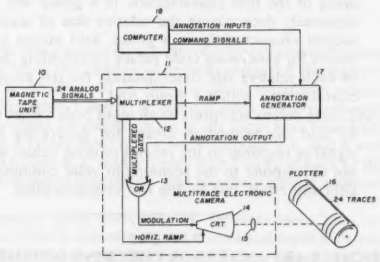
replacing means connected to the data store and said register means, including first and second gating means and comparing means, operative subsequent to the processing of the accessed data by the first program of instructions, for comparing by said comparing means the data in the addressed location of the data store and the data from said first register means for producing alternate signals indicating inequality or equality, and for replacing the data in said first register means with the data from the addressed location in the data store by said first gating means upon inequality, or replacing the data in the addressed location of the data store with the processed data from said second register means by said second gating means upon equality.

3,886,526

SEISMIC TRACE ANNOTATION GENERATOR

Clarence G. Smith, Irving, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,925
Int. Cl. G01d *1/00*
U.S. Cl. 340—172.5 **5 Claims**



1. In a seismic data processing system for photographically reproducing seismic data from a plurality of seismic channels in which the electron beam of a cathode-ray tube is intensity modulated one time during each sweep across the face of the cathode-ray tube for each of said seismic channels and a drum recorder which rotates past the face of the cathode-ray tube to photographically record each such sweep of the electron beam, thereby producing a photographic recording of the seismic traces in parallel relationship, the method of annotating the recording with alpha-numeric characters, comprising the steps of:

a. storing a plurality of alpha-numeric characters in the form of digital bit character matrices, such characters to be reproduced in a line across the photographic recording,

b. synchronizing a plurality of clock pulses with each sweep of the electron beam across the face of the cathode-ray tube,

c. modulating the electron beam at the frequency of said clock pulses with the bit information from the first row of each of the stored character matrices to thereby display the first row of each character matrix sequentially across the face of the cathode-ray tube, the electron beam being unmodulated for a predetermined number of clock pulses between the first row of each character matrix to provide for the horizontal character spacing on the recording,

d. producing a photographic recording in side-by-side relationship of each sweep of the electron beam whereby the

width of each character recorded on the photographic recording is proportional to the frequency of said clock pulses, and

e. repeating steps (c) and (d) for each succeeding row of the character matrices, the recording of the line of characters being complete when the electron beam has been modulated by the bit information contained in the last row of the character matrices.

3,886,527

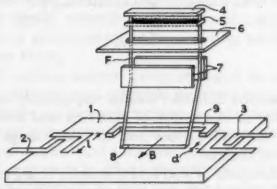
PIEZOELECTRIC DELAY LINE FOR STORING HIGH FREQUENCY SIGNALS

Alain Bert, and Gerard Kantorowicz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 26, 1973, Ser. No. 427,572

Int. Cl. G11c *27/00, 13/00*

U.S. Cl. 340—173 CR **9 Claims**



1. A device for storing travelling surface waves comprising, inside a vacuum tight enclosure;

a delay line made of an elongated block of piezoelectric material producing secondary electrons when struck by primary electrons;

two transducers, each one being mounted at an extremity of said elongated block, for transducing high frequency electrical signals into acoustic waves and vice-versa, said acoustic waves propagating between said two transducers along a propagation path defining a substantially rectangular work surface;

an electron gun for emitting a thin beam of primary electrons towards said work surface, said electron gun being designed and controlled for providing for said electron beam a substantially rectangular cross-section smaller than said work surface, in such a way that said electron-beam strikes said work surface along a substantially rectangular impact surface which is a narrow band of said work surface;

and deflection means for deflecting said electron beam so that said beam substantially sweeps the whole surface of said work surface.

3,886,528

PROGRAMMABLE CONTROL APPARATUS

Jamshed Irani, Oberkulm, and Eduard End, Aarau, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

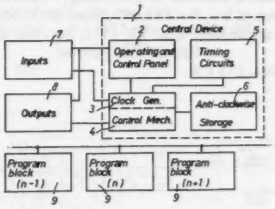
Filed Feb. 25, 1974, Ser. No. 445,638

Claims priority, application Switzerland, Feb. 27, 1973, 2849/73

Int. Cl. G11c *13/00*

U.S. Cl. 340—173 R **16 Claims**

1. A programmable control apparatus for controlling switching devices according to a number of flow diagrams which are interdependent and/or independent of one another, comprising, in combination, a plurality of addressed input stages for the reception of binary input information signals characteristic of the conditions of the switching devices connected therewith; a plurality of addressed output stages with connections for the switching devices for delivering output-information signals characteristic of switching commands; a central unit with which there are connected, via a common address line, said input stages and said output stages; a plurality of addressed program blocks, each having a respective read-out storage for the preserved storage at addressed storage positions of coded command and address information characteristics of the individual steps of a flow diagram, and a respective stepping storage which delivers the address signals for the storage positions of said read-out storage; a common program address line, a common command line and a common stepping-control signal line, said lines interconnecting said program blocks; said central unit containing: a clock generator generating in successive periods a respective predetermined number of time-displaced clock signals which do not overlap one another; a cyclically through-counting program address counter with which there is connected said program address line, a command register with which there is connected said command line, a control logic for the evaluation of decoded command signals, a command decoding circuit for



connecting said control logic with said command register, said input stages being connected with said control logic by means of a common input information line, and said output stages by means of a common output information line; and an address storage with random access for the command-dependent storage of program block addresses; each of said program blocks being provided with at least one timing circuit, wherein during each period of the clock signals by means of a first clock signal said program address counter is indexed by one step, by means of a second clock signal said command register is read in, by means of at least one last clock signal according to the momentary program block address there is controlled at least one of said timing circuits provided for the relevant program block, and by means of the remaining clock signals there is controlled said control logic as a function of the read-in command signal, so that during each counting cycle of said program address counter all of said program blocks are sampled, and during each period there is carried out a command.

3,886,529

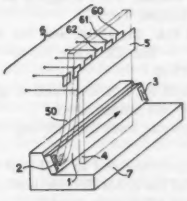
ELECTRO-ACOUSTIC MEMORY DEVICE

Alain Bert, and Gerard Kantorowicz, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 26, 1973, Ser. No. 427,573

Int. Cl. G11c *11/30, 27/00*

U.S. Cl. 340—173 CR **3 Claims**



1. An electro-acoustic memory device comprising a piezoelectric substrate; an input and an output transducer mounted thereon at its both ends for transmitting high frequency signals from said input transducer toward said output transducer by

means of elastic waves propagating along the surface of the substrate; means for sweeping said surface with a beam of electrons which interact with said elastic wave and provide a record of said wave by providing a potential distribution on said surface, said sweeping means also subsequently sweeping said surface with a beam of electrons to cancel said potential distribution and stimulate elastic waves propagating on said substrate, and which are a reproduction of the recorded wave; and including means for selectively operating said sweeping means to impinge the electron beam on different zones of said surface disposed side by side in the direction of said wave propagation in a selective fashion and in a preferential order.

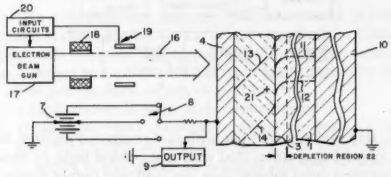
3,886,530
SIGNAL STORAGE DEVICE

Ernest E. Huber, Carlisle; Mitchell S. Cohen, Jr., Watertown, and Donald O. Smith, Lexington, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 859,097, Sept. 18, 1969, abandoned. This application Aug. 17, 1972, Ser. No. 281,608

Int. Cl. H01j *29/44*

U.S. Cl. 340—173 CR **46 Claims**



1. A device for detecting stored information represented by stored electrical charge comprising,

an interface formed between a semiconductor material and an insulator material,

means for reversibly changing the electric charge stored in a given area of said insulator material adjacent the interface, in representation of said information,

said electric charge change being sufficient to produce a change in a space charge region in the semiconductor material in registration with the given area in representation of said information,

signal detecting means coupled to the device for detecting current flow across the interface, and

means for producing and directing an electron beam into said space charge region in the semiconductor producing a transient current signal in the detecting means representative of said stored information.

3,886,531
SCHOTTKY LOADED EMITTER COUPLED MEMORY CELL FOR RANDOM ACCESS MEMORY

Jon L. McNeill, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 11, 1974, Ser. No. 441,085

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **1 Claim**

1. A memory cell for non-destructive addressing and readout, said memory cell comprising:

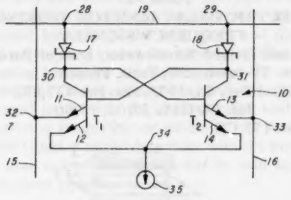
a pair of sense/write lines also serving as one set of decode lines,

a voltage line unconnected to said pair of sense/write lines and serving as the other decode line orthogonally related to said one set of decode lines,

a bistable circuit including first and second transistors having respective collector, base and emitter electrodes connected in cross-coupled relationship,

each of said emitter electrodes for said first and second transistors including emitter pairs comprising an access/sense emitter and a store emitter, the store emitters of each emitter pair being connected in common, and the access/sense emitters of each emitter pair being respectively connected to the one of the pair of sense/write lines corresponding thereto,

a store current source connected to said commonly coupled store emitters for maintaining a standby cell current through said first and second transistors via the store emitters thereof,



first and second Schottky diodes respectively connected to the collector electrodes of said first and second transistors at one end thereof and to said voltage line at the other end thereof,

the base electrode of said first transistor being connected to a junction point between said second Schottky diode and said collector electrode of said second transistor, and

the base electrode of said second transistor being connected to a junction point between said first Schottky diode and said collector electrode of said first transistor.

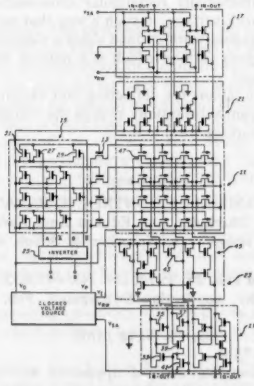
3,886,532
INTEGRATED FOUR-PHASE DIGITAL MEMORY CIRCUIT WITH DECODERS

Horst A. R. Wegener, Carlisle, Mass., and Douglas R. Askegard, Minnetonka, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 467,968

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **9 Claims**



1. A digital memory circuit of the type employing variable threshold insulated gate field effect memory transistors arranged in word rows and bit columns on a common substrate, each of said memory transistors including gate, source and drain electrodes, said circuit comprising:

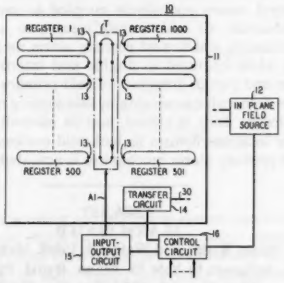
a clocked voltage source for supplying READ and WRITE sequential pulse trains to components in said memory circuit,

word line decoder means,
individual buffer transistor means for applying gate control voltages from said clocked voltage source to corresponding word rows of memory transistors in response to output signals from said word line decoder means,
bit line decoder means for selectively intercoupling individual bit columns of said memory array with external utilization circuits,
said clocked voltage source including means to apply decoder control voltages and substrate control voltages to said word line decoder and said common substrate,
said word line decoder means including means for turning on all of said buffer transistors in response to a decoder control voltage from said clock voltage source,
said decoder means further including means response to a received address signal for temporarily retaining a specified buffer transistor in a conducting condition after the termination of a decoder control voltage, said specified transistor being uniquely determined by the value of said address signal, whereby only the addressed word line receives a gate control voltage during such temporary retention times,
said clock voltage source being arranged to provide gate control voltages and substrate control voltages of opposite polarity during such temporary retention times,
said clocked voltage source further being arranged to produce gate control and substrate control voltages during a WRITE sequence in which the differential pulse magnitudes are sufficient to shift the conduction threshold of the memory transistors whereby the binary state of the transistors in the word row corresponding to said address signal may be reversed during such temporary retention times.

3,886,533
MAGNETIC DEVICES UTILIZING GARNET EPITAXIAL MATERIAL

William Adam Bonner, Warren; Joseph Edward Geusic, Berkeley Heights, and LeGrand Gerard Van Uitert, Morris Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 380,941, July 20, 1973, abandoned. This application Jan. 23, 1974, Ser. No. 435,678
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **12 Claims**

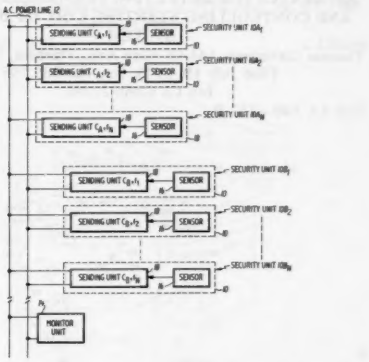


1. Memory device comprising a substrate supporting at least a first epitaxial layer, the said layer being capable of evidencing uniaxial magnetic anisotropy capable of supporting local enclosed regions of magnetic polarization opposite to that of surrounding material and provided with first means for magnetically biasing said layer to stabilize said regions, second means for positioning such oppositely polarized local and enclosed regions, and third means for propagating such local regions, said material being of the garnet structure, characterized in that the composition of the said material of the said first layer may be represented by the atom formula $(Y,La,Lu,Bi)_{3-a-b}R_aM_bFe_{5-c-d-e}(Al,Ga)_c(Si,Ge)_dV_eO_{12}$, where R is one or a combination of Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm and Yb and where R is at least 50 percent Eu; M is at least one of Ca, Sr and Cd; a is from **0.03–0.2** for all except Tb, Dy and Ho for which a is from **0.03–0.1**; b is from **0.5–1.5**; c is from 0–0.5; d is from **0.5–1.3**; and e is from **0–0.5** and herein d is at least equal to $c+e$ (i.e., at least one-half of the ions replacing iron are silicon and/or germanium); the said first layer having a magnetostrictive value which is of negative sign, the said first layer and substrate being mismatched in lattice parameter by an amount expressed as a differential value of the lattice parameter a_o of from 0.005 to 0.017 with the valve of the said lattice parameter being larger for the substrate so as to result in strain induced anisotropy resulting in polarization direction normal to the plane of the said first layer, the total said anisotropy being at least 50 percent due to strain resulting from the said mismatch in the lattice parameter.

3,886,534
SECURITY SYSTEM

Norwood Rosen, Pompano Beach, and Anthony J. Nicolini, Lighthouse Point, both of Fla., assignors to Polar Corporation, Pompano Beach, Fla.

Filed Jan. 8, 1973, Ser. No. 321,933
Int. Cl. G08b *17/06*
U.S. Cl. 340—216 **5 Claims**



1. A security system for use with an a.c. power line connected between a plurality of locations comprising:
a plurality of security units, each including a sensor for detecting the opening of a portal and a sending unit responsive to said sensor for coupling to the a.c. power line an amplitude modulated radio frequency signal identifying the location of the security unit at which said predetermined condition exists, each of said sending units including:
a radio frequency oscillator for generating a carrier signal having a predetermined frequency common to a plurality of said sending units, and
means for amplitude modulating said carrier signal, the combination of the predetermined frequency and the amplitude modulation being unique to each of said security units,
one of said sending units includes switch means biased to couple said amplitude modulated radio frequency signal to said a.c. power line and manually operable against said bias to uncouple said amplitude modulated signal to said a.c. power line,
said one sending unit being disposed in sufficient proximity to the portal to permit the manual operation of said switch means simultaneously with the manual opening of the portal to permit the opening of the portal without the coupling of said amplitude modulated signal to said a.c. power line,
the bias of said switch means being sufficient to couple said amplitude modulated signal to said a.c. power line in the event that the open condition of the portal persists beyond the manual operation of said switch means

so that the natural act of stepping away from the portal upon the forceable entrance of an intruder through the portal couples said condition responsive signal to said a.c. power line; and,

a monitor unit coupled to said a.c. power line at a location remote from said plurality of security units and responsive to the coupling of amplitude modulated radio frequency signals on the a.c. power line for indicating at which of said security units said sensed predetermined condition exists; said monitor unit including a plurality of modules,

each of said modules associated with a predetermined group of said security units having a common carrier frequency different from the carrier frequency of all of the remaining ones of said security units,

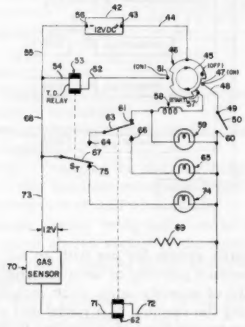
each of said modules having means for indicating at which of the security units in an associated group said predetermined condition exists, and

each of said modules including a plurality of switch means responsive to a different frequency of modulation to actuate said indicating means.

3,886,535
APPARATUS FOR DETECTING FLAMMABLE VAPORS AND CONTROLLING STARTING COIL OF IGNITION SYSTEM

Thomas Cirincione, 144-08 32nd Ave., Flushing, N.Y. 11354

Filed July 19, 1973, Ser. No. 380,755
Int. Cl. G08b *21/00*
U.S. Cl. 340—237 R **8 Claims**



1. Apparatus for detecting the presence of flammable vapors and for controlling the starting coil of the ignition system of an internal combustion engine in accordance with the result thereof, said apparatus comprising:

a. indicating means for indicating the operational status of said ignition system;

b. a source of current for activation of said starter coil;

c. manually operable switch means adapted to couple said source of current to said indicating means in accordance with the selected position of said switch;

d. time delay means directly connected to one terminal of said source of current and being connected solely by said switch means to another terminal of said source of current and providing a first segment of a series current path for said starter coil after a predetermined period of time;

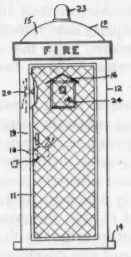
e. means for providing the remaining segment of said series current path for said starter coil; and

f. sensor means exposed to flammable vapors and having a conductive state which is inversely related to the quantum of flammable vapors present for detection, said sensor means being adapted to open said remaining segment of said series current path upon the detection of flammable vapors and to maintain said remaining segment of said series current path completed in the absence of flammable vapors, whereby said indicating means provides at least a visual signal signifying the status of the system as being in a condition selected from (1) warm-up period, (2) ignition-ready, and (3) non-operational, said time delay means providing said segment of the series current path for said starter irrespective of the conductive state of said sensor means.

3,886,536
ALARM BOOTH

Yale M. Mann, 1135 Rydal Rd., Rydal, Pa. 19046

Filed June 27, 1973, Ser. No. 374,248
Int. Cl. G08b *21/00*
U.S. Cl. 342—304 **17 Claims**



1. A personnel detention system for holding captive a person who actuates an alarm circuit, comprising in combination,

a. a primary alarm mechanism having an actuator,

b. an enclosure within which said primary alarm mechanism is mounted, said enclosure having a door through which a person desiring to actuate said alarm may pass, and said enclosure having no other means of ingress or egress,

c. an interference mechanism normally operative to prevent operation of said primary alarm mechanism,

d. an actuatable door lock mechanism operatively associated with said enclosure door,

e. sensing means for sensing whether or not said enclosure door is closed,

f. control means operatively coupled to said interference mechanism, to said sensing means, to said door lock mechanism and to said primary alarm mechanism effective when operated to disable said interference mechanism and permit actuation of said primary alarm mechanism responsive to sensing by said sensing means that said enclosure door is closed, and to normally actuate said door lock mechanism to lock said enclosure door when said primary alarm mechanism is actuated.

3,886,537
ALARM BOOTH

Yale M. Mann, Rydal, and Walter B. Udell, Melrose Park, both of Pa., assignors to Yale M. Mann, Rydal, Pa.

Filed June 28, 1973, Ser. No. 374,399
Int. Cl. G08b *21/00*
U.S. Cl. 340—304 **6 Claims**

1. A personnel detention system for holding captive a person who actuates an alarm circuit, comprising in combination,

a. a primary alarm mechanism having an actuator,

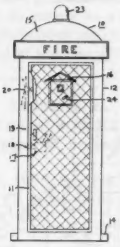
b. an enclosure within which said primary alarm mechanism is mounted, said enclosure having a door through which a person desiring to actuate said alarm may pass, and said enclosure having no other means of ingress or egress,

c. an interference mechanism normally operative to prevent operation of said primary alarm mechanism,

d. an actuatable door lock mechanism operatively associated with said enclosure door,

e. means operative to automatically deactuate said door lock mechanism and unlock said enclosure door after a predetermined time has elapsed from actuation of said lock mechanism,

f. sensing means for sensing whether or not said enclosure door is closed,

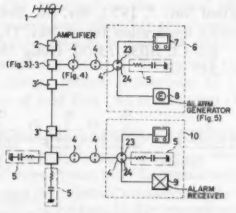


g. control means operatively coupled to said interference mechanism, to said sensing means, to said door lock mechanism and to said primary alarm mechanism effective when operated to disable said interference mechanism and permit actuation of said primary alarm mechanism responsive to sensing by said sensing means that said enclosure door is closed, and to normally actuate said door lock mechanism to lock said enclosure door when said primary alarm mechanism is actuated.

3,886,538
ALARM SENDING AND RECEIVING SYSTEM INCORPORATED IN A CATV SYSTEM

Takeshi Takeuchi, Yokohama, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed May 11, 1973, Ser. No. 359,257
Claims priority, application Japan, May 13, 1972, 47-46888
Int. Cl. G08b *21/00*
U.S. Cl. 340—310 R **5 Claims**

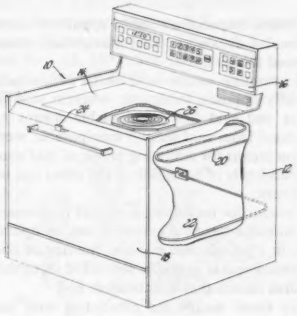


1. An alarm sending and receiving system incorporated in a CATV system which transmits broadcasting signals within one frequency range via a trunk line to a plurality of subscribers, comprising an alarm signal generating means at the subscriber ends of the CATV system for generating an alarm signal in a frequency range lower than said first mentioned frequency range and which can be fully separated from said broadcasting signals, an alarm receiver means adapted to be located at any desirable optionally selected location for receiving the alarm signals from said alarm signal generating means, a bridging means associated with said trunk line and provided with a first coupling circuit means cooperating electromagnetically with said trunk line to pass only said broadcast signals, said bridging means also comprising an input terminal and an output terminal on said trunk line and a first bridging terminal, said first coupling circuit means being operatively associated with said trunk line so as to bridge to said bridging terminal said broadcast signals, said bridging means further comprising a first filter between said first bridging terminal and said output terminal to pass only alarm signals of said lower frequency range, a subscriber's terminal circuit comprising an input terminal and an output terminal on said trunk line, a second coupling circuit means operatively associated with said trunk line to effect an electromagnetic coupling for said broadcast signals, a second bridging terminal, a second filter between said trunk line and said second coupling circuit means operable to pass broadcast signals to said bridging terminal means, an alarm connection terminal, and a third filter between said alarm connection terminal and said trunk line for passing alarm signals and preventing passage of said broadcast signals, whereby actuation of an alarm generating signal at one of said alarm signal generating means provides a closed circuit for the alarm signal only between said actuated alarm signal generating means and said receiver means.

3,886,539
DOMESTIC APPLIANCE CONTROL AND DISPLAY SYSTEM

Robert R. Gould, Jr., Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 318,172, Dec. 26, 1972, Pat. No. 3,819,906. This application Apr. 4, 1974, Ser. No. 457,760
Int. Cl. G08b *5/36*
U.S. Cl. 340—337 **2 Claims**



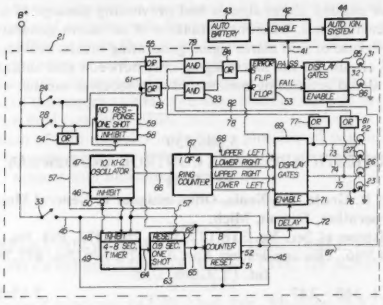
1. A domestic appliance for household operation adapted to be connected to a domestic power supply, said appliance including a plurality of operating elements, a digital control and display panel of planar material imperforate throughout for easy wipe cleanability, display means, said panel including a transparent area through which the user may view said display means, means including said panel forming touch control means for programming said appliance, said touch control means including a plurality of operation selector areas substantially coplanar with said panel and respectively identifiable with each of said plurality of operating elements, said areas being located on the user's side of said panel and user touchable for selecting an operation of one of said plurality of operating elements and for entering a desired operating value for the operation of the operating element selected, power supply control means for controlling the application of said power supply to said operating elements, digital logic means responsive to the user's touch of said touch control means to enable said power supply control means to apply power to a selected one of said operating elements in accordance with the desired operating value entered by the user, and display control means responsive to the selection of the operation of one of said operating elements and to the entering of a desired operating value for enabling said display means to display through said transparent area the operating value entered as a visual feedback to the user.

3,886,540

CONDITION RESPONSIVE CONTROL APPARATUS

E. Donald Sussman, Natick, and Andrew Warner, Weston, both of Mass., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Sept. 7, 1973, Ser. No. 395,241
Int. Cl. G08b 21/00
U.S. Cl. 340—279 **11 Claims**



1. Condition responsive control apparatus comprising:
first stimulus means and first manipulable means spacially opposed therewith;
second stimulus means and second manipulable means spacially opposed therewith; wherein said first stimulus means and said first manipulable means are spacially separated from said second manipulable means;
actuation means for actuating either of said stimulus means independently of actuation of the other one of said stimulus means;
output means for indicating a correct response when one of said stimulus means is activated and an operator manipulates, in a preselected manner, the one of said manipulable means that is spacially separated from the one of said stimulus means that is activated; and
response timer means for preventing said output means from indicating a correct response if the operator fails to manipulate the appropriate one of said manipulable means within a preselected response period of time.

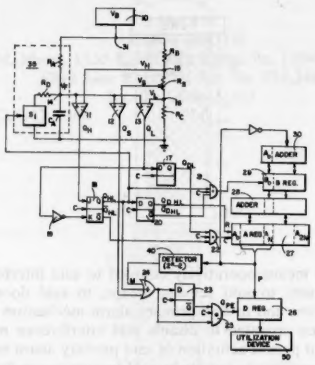
3,886,541

EXPONENTIAL RAMP A/D CONVERTER

George A. Watson, Tustin, and John J. Bollinger, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 25, 1973, Ser. No. 354,298
Int. Cl. H03k 13/16
U.S. Cl. 340—347 AD **14 Claims**

1. In combination,
ramp signal generating means,
voltage divider means,
comparator means connected to said ramp signal generating means and said voltage divider network in order to produce a signal representative of the relationship between signals produced by said ramp signal generating means and said voltage divider network,
logic means connected to said comparator means to produce an output signal as a function of the signal produced by said comparator means,
recirculating register means for producing an output signal representative of the digital signal, said recirculating register means connected to said logic circuit means to have the operation thereof controlled by the signals produced by said logic circuit means,
said recirculating register means including output register means connected to supply output signals to a utilization device,
first register means connected to selectively supply a portion of the contents thereof to said output register,
first adder means for receiving said portion of the contents of said first register means,



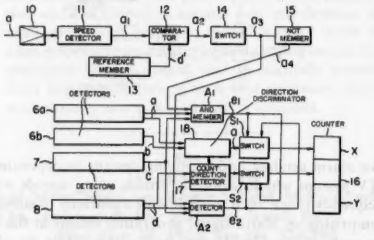
second register means connected to selectively receive the contents of said first adder means where the contents of said first adder means is the sum of the contents of said second register means and said portion of the contents of said first register means, and
second adder means for adding the contents of said first register means to the contents of said second register means and selectively storing same in said first register means.

3,886,542

DEVICE FOR MEASURING DISPLACEMENT

Minoru Ohtsuka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Nov. 7, 1972, Ser. No. 304,358
Claims priority, application Japan, Nov. 11, 1971, 46-90091
Int. Cl. H03k 13/00; G06g 7/00
U.S. Cl. 340—347 AD **7 Claims**



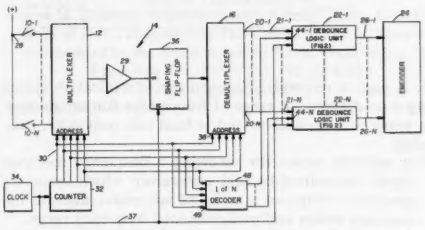
1. A device for measuring displacement of a graduated scale, by counting its graduations moving past a detecting position, comprising, in combination, plural scales, having respective different pitches between their graduations, movable in unison past a graduation detecting position; plural graduation detector means at said graduation detecting position each operatively associated with a different respective scale; at least one of said scales having fine graduations arranged successively in groups each including the same number of fine graduations, and at least another of said scales having coarse graduations each corresponding to a respective group of said fine graduations; a counter having plural digit posi-

tions; and switching means connecting said detector means to said counter and operable, responsive to movement of said scales past said graduation detecting position at a relatively low speed, to supply, to the low digit position of said counter, input signals from the detector means operatively associated with said at least one scale, and operable, responsive to movement of said scales past said graduation detecting position at a relatively higher speed, to supply, to a higher digit position of said counter, input signals from the detector means operatively associated with said at least another of said scales.

3,886,543
DEBOUNCE LOGIC FOR KEYBOARD

Robert E. Marin, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Nov. 29, 1973, Ser. No. 420,124
Int. Cl. H04l *15/06*
U.S. Cl. 340—365 E **15 Claims**



1. Debounce logic for use with a keyboard having a plurality of selectively actuable sequentially scanned keyswitches; each of said keyswitches being operable between a first steady state condition and a second steady state condition and initiating a first signal (A) in response thereto comprising:

first digital storage means receiving said first signal (A) from a selected keyswitch;

first logic means responsive to said first signal (A) and a second signal (B) provided at the output of said first digital storage means and related to the operative condition of said selected keyswitch during a previous scan;

said first logic means supplying a third signal (D, E) to a second digital storage means in response to a predetermined condition of said first (A) and second (B) signals; and

means for synchronizing the stepping of said signals through said first and second digital storage means whereby said second digital storage means provides an output signal (F, G) in response to a steady state condition of said selected keyswitch as indicated by the same operative condition during consecutive scans.

3,886,544
KEYBOARD USING OPTICAL SWITCHING

Leo H. Narodny, Martin's Bay, St. John, Barbados, British W. Indies

Filed June 12, 1974, Ser. No. 478,509
Int. Cl. H04l *15/06*
U.S. Cl. 340—365 P **2 Claims**

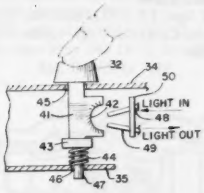
1. A terminal for producing coded multi-bit signals comprising,

a. a keyboard having a plurality of character and special purpose keys,

b. a point source of light coupled to a plurality of input bundles of fiber optics, each bundle corresponding to a key, said coupling means including an axicon lens,

c. an ellipsoidal bivalued switch associated with each key, said switch selectively coupling light between an input fiber bundle to an output bundle of fiber optics,

d. for each key, said input fiber bundle and output fiber bundle spaced apart the distance between the foci of said reflector,



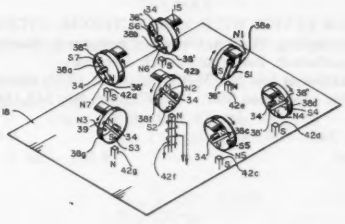
e. said output fiber bundle from each of said keys selectively connected in coded relationship with a plurality of phototransducers,

f. the ends of each fiber optic associated with each phototransducer coupled through an axicon lens onto said phototransducer.

3,886,545
SEGMENTAL READOUT DEVICE HAVING IMPROVED MAGNETIC CIRCUIT COMPONENTS

Alfred Skrobisch, Huntington Station, N.Y., assignor to The Staver Company, Incorporated, Bay Shore, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,749
Int. Cl. G08b *5/26*
U.S. Cl. 340—373 **9 Claims**



1. A segmental readout device comprising:

a support plate;

seven rotatable indicator members rotatably supported by said support plate each of said indicator members comprising a permanent magnet, said indicator members being disposed in a Figure "8" spaced array with a group of lateral magnets rotating on axially spaced, parallel vertical axes and another group of centered magnets rotating on axially spaced parallel horizontal axes, each of said magnets having a N and a S pole, with the poles of said lateral magnets being oriented oppositely from the poles of said centered magnets for effectively reducing the magnetic effect of each of said magnets on all adjacent magnets;

a back plate carrying seven magnetic cores on said back plate and extending forwardly to said support plate;

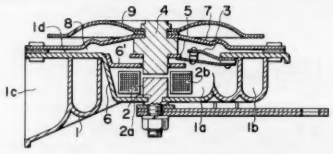
a cylindrical electromagnetic coil mounted on each of said cores for selectively energizing and rotating said indicator members; and

a front window plate supported by said support plate and forwardly thereof said front window plate having seven elongated openings for selectively exposing said indicator members thereat to indicate selected characters.

3,886,546
ELECTRIC HORN

Mitsuru Ueda, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya-shi, Japan

Filed Apr. 13, 1973, Ser. No. 351,037
Int. Cl. G10k *9/00;* **G08b** *3/00*
U.S. Cl. 340—388 **3 Claims**

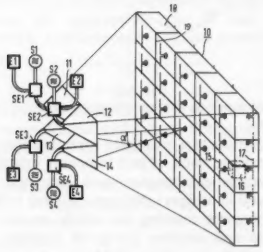


1. An electric horn comprising a vortical acoustic transformer having a sound inlet port, an electromagnet fixedly secured on said transformer at the center thereof, means for energizing said electromagnet, interrupting means for interrupting the energizing current to said electromagnet, a movable armature disposed proximate said electromagnet, said armature being attracted to said electromagnet when energized by said energizing current, a diaphragm having a portion thereof fixedly secured to said transformer and having another portion thereof fixedly secured to said armature, said diaphragm being moved in accordance with the movement of said armature, said diaphragm enclosing the sound inlet port of said transformer, and a vibrator fixedly secured to said diaphragm and said armature on the side of said diaphragm opposite said transformer.

3,886,547
RADAR DEVICE WITH A DIRECTIONAL ANTENNA

Hans Bottenberg, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 38,432, May 18, 1970, abandoned. This application Mar. 19, 1973, Ser. No. 342,459
Int. Cl. G01s *3/74*
U.S. Cl. 343—100 SA **9 Claims**

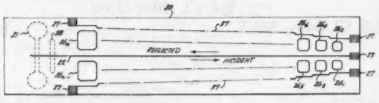


9. A radar system comprising a radar device; a directional antenna associated with said radar device and having a resolved distance resolution and a resolved bandwidth limiting resolution; a plurality of radiators included in said antenna; a central feeding device in said radar device for providing simultaneous transmission of a plurality of radar signals at different frequencies; and a plurality of coupling means for coupling said central feeding device to individual ones of said radiators over different length paths, each of said coupling means including an adjustable phase changer to insure that the path differences of said different frequencies is not greater than 360°, and wherein the number of different frequency radar signals is selected to be as near as possible to a maximum value given by the ratio between the required distance resolution for the radar device as a system parameter and the maximum distance resolution obtainable with the given directional antenna due to radar signals at multiples of 360° arriving from the different individual radiators phase shifted at the target.

3,886,548
RESPONDER FOR USE IN A PASSIVE IDENTIFICATION SYSTEM

Henrie Lionel Majeau, Bellevue, and George Washington Fitzsimmons, Lynnwood, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 12, 1973, Ser. No. 405,743
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.8 R **10 Claims**



1. A passive responder for use in an identification system using a predetermined range of frequencies for communication between a transceiver and at least one responder, comprising:

first antenna means for receiving a frequency spectrum signal transmitted by said transceiver, which frequency spectrum comprises a series of successive discrete frequencies within said predetermined frequency range;

a first transmission line, connected to said first antenna means, along which first transmission line said received frequency spectrum signal propagates;

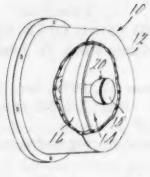
a plurality of coupling means comprising directional ring filters aligned axially along said first transmission line and individually tuned so as to facilitate coupling of signal energy of selected frequencies of said frequency spectrum signal into selected coupling means, resulting in signal energy at frequencies other than said selected frequencies propagating further along said first transmission line; and

second antenna means coupled to said first transmission line for transmitting said other frequencies to said transceiver.

3,886,549
INTRUSION DETECTION SYSTEM

James Cheal, Plymouth, and Vincent J. McHenry, Farmington, both of Mich., assignors to Omni Spectra, Inc., Farmington, Mich.

Continuation-in-part of Ser. No. 237,745, March 24, 1972, abandoned. This application June 7, 1973, Ser. No. 367,700
Int. Cl. G01s *9/42;* **G08b** *13/00;* **H01q** *19/14*
U.S. Cl. 343—7.7 **22 Claims**



1. An intrusion detecting system comprising:

antenna means for receiving electromagnetic energy including a reflector, a dielectric member having an exposed end surface for removably supporting at least one of a plurality of interchangeable antenna elements of thin metallic material on said end surface and at least partially

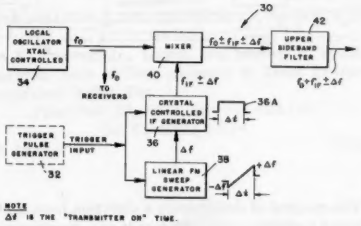
covering said end surface having a configuration which is the part of or the whole of a circular configuration in a location relative to said reflector so that said received electromagnetic energy is directed by said reflector to said one antenna element, said reflector cooperating with any one of said interchangeable antenna elements for providing a reception pattern of predetermined configuration with the predetermined configuration provided by respective ones of said interchangeable antenna elements substantially differing each from the other to thereby provide substantially differing areas of surveillance of said intrusion detecting system; and

means associated with said antenna means for detecting a low frequency component of said received electromagnetic energy for providing an output signal which is indicative of an intrusion.

3,886,550
DUAL OSCILLATOR

Frank M. Gilleran, Smithtown, and Arlindo Jorge, Glen Cove, both of N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 26, 1969, Ser. No. 854,808
Int. Cl. G01s 7/28
U.S. Cl. 343—17.2 R **6 Claims**



1. A radar system including a transmitter and receiver, comprising:

a local crystal-controlled oscillator for producing a carrier frequency f_o, which is the local oscillator frequency for the transmitter and receiver;

a trigger pulse generator;

a crystal-controlled IF generator, one of whose inputs is connected to the trigger pulse generator, for generating a train of frequencies having a frequency f_{IF}, the train being triggered by and limited in length and time duration Δt by pulses generated by the trigger pulse generator;

a function generator triggered coincidentally with the IF generator by pulses, of the same time duration Δt, from the trigger pulse generator, whose output is connected to the input of the IF generator, for modulating the train of pulses generated by the crystal-controlled IF generator as a function Δf of frequency f;

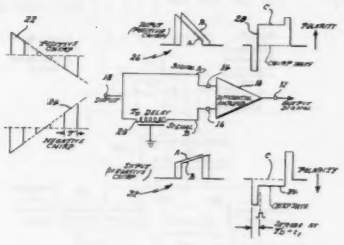
a mixer whose inputs are the outputs of the local oscillator and the crystal-controlled IF generator, and whose output frequency is $f_o \pm f_{IF} \pm \Delta f$; and

an upper sideband filter connected to the output of the mixer, for removing all sidebands except those within the frequency range of $f_o + f_{IF} \pm \Delta f$, this being the transmitter output frequency.

3,886,551
VIDEO SLOPE RATE DETECTOR

Norman G. Hempling, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 858,755, Sept. 12, 1969, abandoned.
This application May 26, 1972, Ser. No. 258,001
Int. Cl. G01s 7/36
U.S. Cl. 343—18 E **2 Claims**



1. A method of measuring the slope and polarity of an applied signal, which comprises:

applying a pulsed input signal to a differential amplifier first input terminal,

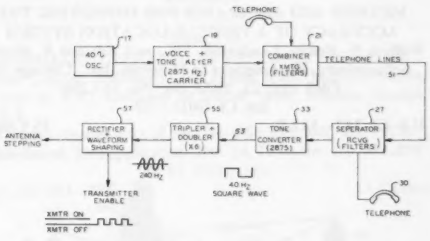
delaying said pulsed input signal by a predetermined time and applying it to the second input terminal of said differential amplifier,

processing said pulsed input signal and said delayed pulsed input signal within said differential amplifier to provide an output signal which is an indication of the slope direction and polarity of said pulsed input signal.

3,886,552
SYNCHRONIZATION OF SPLIT SITE LANDING SYSTEMS

Adolph M. Gluck, Woodcliff Lake, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Apr. 8, 1974, Ser. No. 458,778
Int. Cl. G01s 1/16
U.S. Cl. 343—108 R **10 Claims**



1. An improved synchronization system for a split site landing system comprising:

a. means to generate a bipolar synchronizing signal;

b. means to encode said synchronizing signal for transmission over a telephone line;

c. a telephone line coupling said encoded signal to at least one of the sites of the split site landing system;

d. means to decode the signal on said line;

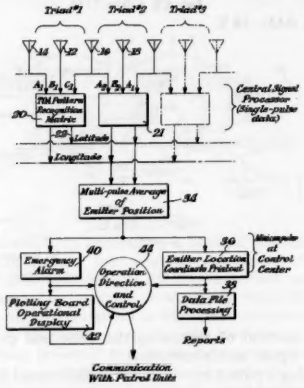
e. means to rectify said decoded synchronizing signal so as to use only one of the positive and negative cycles of said synchronizing signal; and

f. means to provide said rectified signal as an antenna stepping signal and transmitter enable signal to the antenna at said site.

3,886,553
COORDINATE LOCATING METHOD AND SYSTEM

John K. Bates, 240 Ridgefield Rd., Endicott, N.Y. 13760

Filed Mar. 15, 1973, Ser. No. 341,729
Int. Cl. G01s 5/04
U.S. Cl. 343—112 R 19 Claims



1. A system for locating a point constituting an emitter in a continuous functional space defined by at least a pair of parameters comprising, in combination,

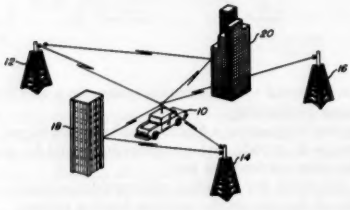
sensor means for receiving manifestations from said emitter, means for encoding said manifestations in terms of relative time delay differences between the manifestations derived from different ones of said sensor means, and

comparator means for comparing the time of arrival pattern of said manifestations with a catalog of stored manifestations corresponding to predetermined sets of relative time difference patterns of said manifestations corresponding to different reference points in said space and providing a discrete output manifestation corresponding to the coarse location of said point in terms of said reference points.

3,886,554
METHOD AND APPARATUS FOR IMPROVING THE ACCURACY OF A VEHICLE LOCATION SYSTEM

William V. Braun, Lauderhill, Fla., and Edward F. Handy, Schaumburg, Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Apr. 23, 1973, Ser. No. 353,286
Int. Cl. G01s 3/02
U.S. Cl. 343—112 R 16 Claims



1. The method of locating the position of a vehicle comprising the steps of:

radiating a radio signal from the vehicle in a predetermined radiation pattern;

switching the directivity of said radiation pattern to a predetermined sequence of radiation patterns;

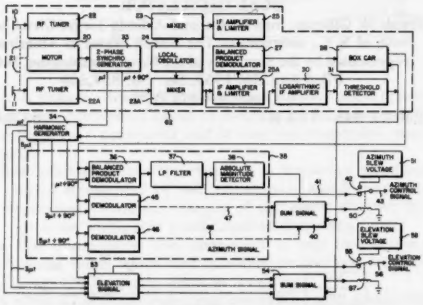
receiving said radio signal in said sequence of radiation patterns at two geographically spaced receiving sites;

comparing the signals received at said two sites to determine the location of said vehicle.

3,886,555
RADIATING TARGET DIRECTION FINDING SYSTEM

Douglas E. Royal, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed June 4, 1973, Ser. No. 366,782
Int. Cl. G01s 5/02, 5/04
U.S. Cl. 343—117 18 Claims



1. The method of determining a direction from a platform to a target radiating a wave by means of a direction sensitive detector of the radiated wave including an antenna assembly, said method comprising the steps of:

a. rotating the detector and the antenna assembly about a predetermined axis of rotation; and

b. comparing, in synchronism with the rotation of the detector and the antenna assembly, to one another the output signals obtained at a plurality of pairs of points diametrically opposite to each other with respect to the axis of rotation to develop a set of difference signals, thereby to provide an error signal from which the direction from the platform to the target may be obtained.

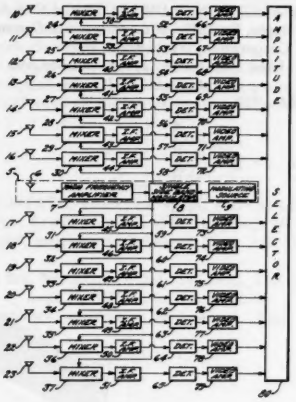
3,886,556
MULTICHANNEL DIRECTION FINDING RECEIVER SYSTEM

Roderic V. Lowman, Greenlawn, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 22, 1963, Ser. No. 274,876
Int. Cl. G01s 3/28
U.S. Cl. 343—119 6 Claims

2. A non-scanning multichannel direction finding receiver system to determine the direction of the source of an incoming radiant energy signal comprising a master channel including an antenna receiving said incoming radiant energy signal, said master channel operating to amplify and single sideband modulate said incoming radiant signal, and a multiplicity of re-

ceiver channels, each of said receiver channels including a mixer connected to an associated antenna to receive said

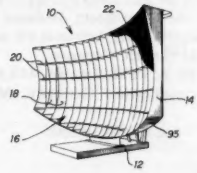


incoming radiant energy signals, said single sideband modulated signal also being received by each of said mixers.

3,886,557
RADAR ANTENNA AND METHOD OF FABRICATING SAME

William E. Townes, Jr., Irving, and Stanley P. Svedeman, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 28, 1973, Ser. No. 420,196
Int. Cl. H01q *15/14*
U.S. Cl. 343—912 **8 Claims**

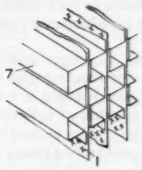


1. The method of fabricating a radar antenna comprising:
a. rigidly mounting a support means for a back support on a base means;
b. connecting a back support to the support means;
c. forming a plurality of spaced slots and an inwardly contoured surface in a plurality of vertical and horizontal ribs;
d. forming a rigid lattice network by interlocking the slots of a plurality of vertical ribs with the slots of a plurality of horizontal ribs to form a plurality of interconnecting compartments having surfaces defining an inwardly contoured support for a reflector of the radar antenna, and connecting upper and lower retaining members to the vertical ribs;
e. attaching the back support frame to the rigid lattice network; and
f. connecting a reflector screen to the inwardly contoured support surface of the rigid lattice network to maintain the contoured reflecting surface of the radar antenna.

3,886,558
ARTIFICIAL DIELECTRIC MATERIAL FOR CONTROLLING ANTENNAE PATTERNS

Rex Henry John Cary, and Alexander McKay Munro, both of Malvern, England, assignors to British Secretary of State for Defense, Whitehall, London, England

Filed July 31, 1973, Ser. No. 384,351
Claims priority, application United Kingdom, Aug. 4, 1972, 36445/72
Int. Cl. H01q *1/28*
U.S. Cl. 343—708 **7 Claims**

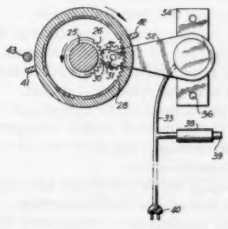


1. An antenna comprising means for transmitting and receiving electromagnetic waves, a shaped core of cellular dielectric material fixed between two high tensile skins of dielectric material, said shaped core being disposed adjacent said transmitting and receiving means, the cellular material of said core comprising a plurality of continuous sheets of thin dielectric material fixed together to form a plurality of elongated, hollow tubular, cells the walls of which constitute said sheets, the walls of said cells being disposed transverse to the direction of transmission and reception of the electromagnetic waves whereby said waves travel through the side walls of said cells, the longitudinal axes of said tubular cells being parallel to one another, the lengths of different ones of said cells differing from one another to define the shape of said core, the opposing ends of the tubular cells being closed by said high tensile skins which are curved smoothly to conform to the relative positions of the ends of said different length cells thereby to provide a core and skin structure which is itself capable of withstanding structural loads, and the surface of at least some of said dielectric sheets carrying numerous discrete electrical conductors of elongated configuration there on operative to modify the dielectric properties of the shaped core thereby to control the antenna radiation pattern.

3,886,559
REMOTELY OPERATED TV RECEIVER ANTENNAE

Frank Lanson, Woodbury, and Milton Spirt, Jamaica Estates, both of N.Y., assignors to Milton Spirt, Jamaica Estates, N.Y.

Continuation-in-part of Ser. No. 426,555, Dec. 20, 1973, abandoned. This application Mar. 14, 1974, Ser. No. 451,283
Int. Cl. H01q *3/00*
U.S. Cl. 343—726 **13 Claims**



1. An arrangement for controlling the positioning of antenna, comprising:

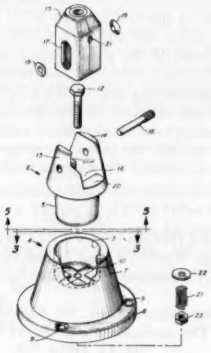
a supporting housing;
a first rotary member supported by said housing and being rotatable with respect to said housing, said first rotary member carrying a first antenna;
a second rotary member rotatable supported on said housing and carrying a second antenna, said second rotary member being substantially concentric with said first rotary member;
a ring gear with internal teeth coupled to said first rotary member;
a spur gear with external teeth coupled to said second rotary member, said ring gear and said spur gear being concentrically rotatable relative to each other;
a pinion gear meshing simultaneously with said spur gear and said ring gear;
an electrical motor with an output shaft drivingly coupled to said pinion gear for rotating said pinion gear when energized, said spur gear rotating in a direction opposite to the direction of rotation of said ring gear when said pinion gear is rotatably driven by said electrical motor so as to rotate said first and second rotary members in opposite directions relative to each other; and
switching means remotely located from said housing and connected to said motor for remotely controlling the operation of said motor and thereby controlling remotely the positioning of said antennae.

3,886,560

ANTENNA SWIVEL MOUNT

Jack G. Mortensen, Bedford, and John L. Hurst, Forth Worth, both of Tex., assignors to Tandy Corporation, Fort Worth, Tex.

Filed May 31, 1974, Ser. No. 475,158
Int. Cl. H01q *3/02*
U.S. Cl. 343—882 **3 Claims**



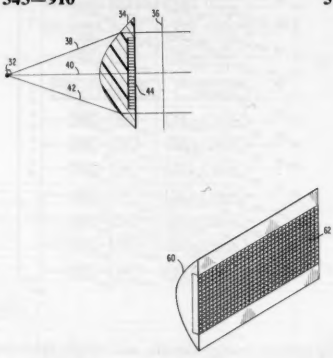
1. A mount for an antenna comprising
A base member having a cylindrical socket,
A swivel member having a cylindrical column disposed in the cylindrical socket of the base member, the swivel member having a generally rectangular socket therein in axial alignment with the cylindrical socket,
detent means on the bottom of the cylindrical column and on the floor of the cylindrical socket, engagement of the detent means inhibiting rotation of the swivel member relative to the base member,
resilient means urging the detent means into engagement,
a shaft carried by ears on the swivel member,
a post of generally rectangular configuration disposed between the ears of the swivel member, the shaft extending through a longitudinal slot in the post whereby the post can slide into the generally rectangular socket in the swivel member and be disengaged from that socket,
and means on the post for receiving the base end of an antenna.

3,886,561

COMPENSATED ZONED DIELECTRIC LENS ANTENNA

John Paul Beyer, Rockville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Dec. 15, 1972, Ser. No. 315,693
Int. Cl. H01q *15/10*
U.S. Cl. 343—910 **5 Claims**



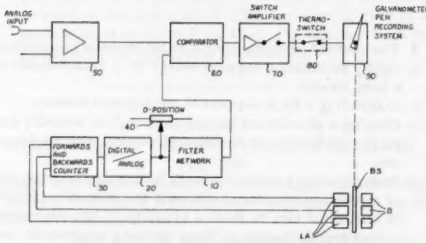
1. A dielectric lens for radio wave antennas, said lens being formed of a solid natural dielectric material having a zone cut-out therefrom and filled with an artificial dielectric material constructed of parallel metal conductive slats and having an apparent index of refraction $\eta_a{}'$ at any frequency f defined by:
$\eta_a{}' = [1 - (\lambda/\lambda_c)^2]^{1/2}$, where;
λ is the free space wavelength of frequency f; and
λ_c is twice the slat-to-slat spacing of said artificial dielectric.

3,886,562

REMOTE POSITION INDICATOR FOR FOLLOW-UP DEVICES IN RECORDING SYSTEMS

Wolfgang Atzinger, and Heinz Reetz, deceased, late of Munich, Germany (by Hildgard Reetz, heir-at-law), assignors to Fritz Schwarzer GmbH, Munich, Germany

Filed Feb. 8, 1974, Ser. No. 440,884
Claims priority, application Germany, Mar. 28, 1973, 2315471
Int. Cl. G01d *3/06*
U.S. Cl. 346—32 **6 Claims**



1. A remote position indicator capable of use in a recording system comprising electrical input signal means for accepting and amplifying an electrical input signal, a rotatable shaft, means for positioning said shaft by converting said signal to rotational motion of said shaft, means connected to said shaft for indicating said position an optical mask affixed to said shaft, said mask containing apertures arranged along separate paths, light source means fixedly positioned relative to motion

of said shaft for shining light upon said mask and through not more than one of said apertures of each of said paths at a given time as a function of shaft position, means for detecting said shined-through light and for converting said shined-through light to electrical signals, said input signal means including means for counting said electrical signals from each of said paths and responsive to the relative times of occurrence of said feedback electrical signals for increasing and decreasing the total count, means for converting said total count to an analog signal, and means for comparing said analog signal and said electrical input signal for controlling said shaft positioning means.

3,886,563

ELECTROSTATIC PRINTER WITH MOVABLE STYLE

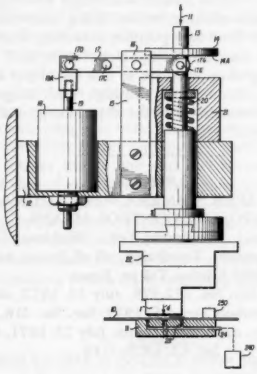
Gabor Forgo; Erwin Meyer, and Karl Moser, all of Zurich, Switzerland, assignors to Zellweger Uster AG, Uster, Switzerland

Division of Ser. No. 272,042, July 14, 1972. This application Aug. 31, 1973, Ser. No. 393,636

Claims priority, application Switzerland, Aug. 16, 1971, 12103/71

Int. Cl. G01d *15/06*

U.S. Cl. 346—74 ES **20 Claims**



1. An apparatus for producing printed images by electrostatic printing techniques, comprising an electrode arrangement and a counterelectrode serving as a support for a carrier for the reception of a latent electrostatic charge image, and means for carrying out a change in spacing between the electrode arrangement and the carrier during the application of an electrostatic charge image to said carrier in order to cause partial discharges for the formation of the electrostatic charge image to travel through different paths across the space between the electrode arrangement and the carrier to provide a substantially uniform deposit of charges at the carrier and therefore a substantially uniform potential distribution within the confines of the electrostatic charge image to be produced, so as to induce a substantially uniform covering of toner particles over the surface of the electrostatic charge image to thereby improve the quality of the electrostatically printed image.

3,886,564

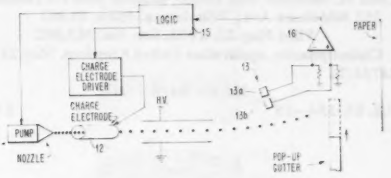
DEFLECTION SENSORS FOR INK JET PRINTERS

Hugh E. Naylor, III, and Robert A. Williams, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 17, 1973, Ser. No. 389,290

Int. Cl. G01d *13/00*

U.S. Cl. 346—75 **11 Claims**



1. A deflection sensing apparatus for ink jet printers, and the like, comprising:

nozzle means for forming and propelling a stream of ink drops, charging means for selectively charging said ink drops, and deflecting means for deflecting said ink drops in accordance with the charge on said drops in at least one predetermined path;

logic means interconnected with said charging means and operable to activate said charging means to charge selected ones of said drops so that they are deflected by said deflection means in a test path that is displaced from said predetermined path, said drops generally travelling in said test path but being subject to deviation therefrom;

sensor means positioned in a test location downstream from said nozzle means and in proximity to said test path, and positioned for sensor coupling with drops proceeding in said test path, said sensor means comprising a pair of planar sensor plates separated by a reference gap, said reference gap being located directly adjacent said test path whereby passage of ink drops in said test path induces signals representative of charges on said drops in said sensor plates due to coupling bettween said drops and said sensor plates and in accordance with the relative deviation of said drops from said test path with respect to said sensor plates, the passage of drops past said reference gap providing a null indication; and

circuit means comprising a differential amplifier and means interconnecting said sensor plates with said circuit means to develop signals for controlling said ink jet stream.

3,886,565

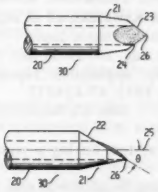
INJECTION NOZZLE FOR AN INK JET PRINTER

Togo Kojima, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed May 9, 1974, Ser. No. 468,476

Int. Cl. G01d *15/18*

U.S. Cl. 346—140 **4 Claims**



1. An injection nozzle for an ink jet printer, comprising a fine pipe having a longitudinal channel for feeding ink therethrough onto a separately positioned paper under the control of an electric field, one end of said pipe being tapered and cut

away along an oblique plane toward and through the axis thereof to form a leading edge facing said paper, and both sides of said leading edge being further cut away to form a sharply pointed end for concentrating said electric field.

3,886,566
SEGMENTED DISC FOR PHOTOCOMPOSING MACHINES

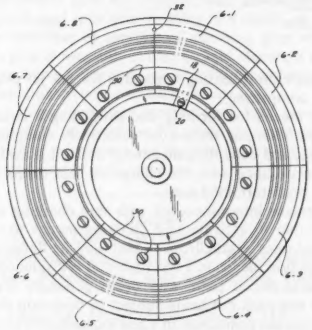
Louis M. Moyroud, and Robert Bennett, both c/o Photon, Inc., 355 Middlesex Ave., Wilmington, Mass. 01887

Filed May 23, 1973, Ser. No. 363,092

Claims priority, application United Kingdom, May 25, 1972, 24754/72

Int. Cl. B41b *17/32*

U.S. Cl. 354—15 **5 Claims**



1. In a photographic type composing machine:

a composite matrix disc mounted on a cylindrical hub, said composite matrix disc comprising a plurality of independently interchangeable segments, each of said segments having an opaque surface and an array of transparent characters thereon; a base provided with an arcuate surface having the same curvature as the outside of said hub, said segments being secured to said base in alignment with each other, whereby each character-bearing surface of each segment is automatically centered and positioned in a plane perpendicular to the axis of said hub by the engagement of the matching surfaces of said hub and said arcuate surface of said base; said hub having an annular radially outwardly extending shoulder formed thereon and the base of each of said segments having an edge portion extending generally perpendicularly to its arcuate surface for abutting engagement with said shoulder, whereby all of the segments in said disc are located in the same plane relative to said hub.

3,886,567
OPTICAL SYSTEM POSITION CONTROLLING DEVICE

Seichi Matsumoto, Yokohama; Kazuya Hosoe, Tokyo, and Akio Sunouchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 20, 1973, Ser. No. 389,507

Claims priority, application Japan, Aug. 28, 1972, 47-86063; Nov. 15, 1972, 47-114571

Int. Cl. G03b *3/10*

U.S. Cl. 354—25 **34 Claims**

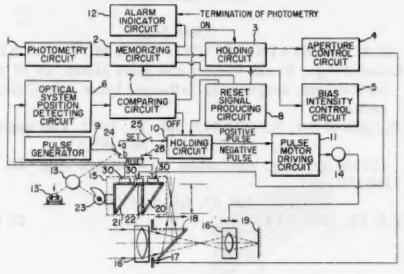
1. An optical system having a controlling device therefor and comprising:

an image forming fixed optical system for forming an image of the object to be photographed;

a light splitting means for splitting a light beam passed through said image forming fixed optical system from the object to be photographed into a first and second light beam;

an image forming movable optical means disposed behind said light splitting means and having an optical axis in alignment with the optical axis of said first light beam, said image forming movable optical means being movable along its optical axis for varying its focusing position;

a position controlling means for controlling the position of said image forming movable optical means, said position controlling means including a position detecting means for detecting the position of the image of the object formed by said image forming fixed optical system, said detecting means being movable in said second light beam



to detect the position of the image of said object in accordance with the brightness of light gathered from the object, an image forming movable optical system shifting means for controlling the movement of said image forming movable optical means, said image forming movable optical system shifting means being controlled by an output signal from said position detecting means,

whereby said image forming movable optical means is moved along its optical axis, so that the object light beam passed therethrough and through said image forming fixed optical system forms the object image at a predetermined position.

3,886,568
PHOTOGRAPHIC CAMERA WITH AUTOMATIC EXPOSURE CONTROL MEANS

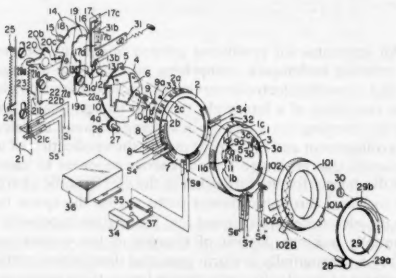
Mutsunobu Yazaki, Yokohama; Yukio Mashimo, Tokyo, and Mutsuhide Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 272,979, July 18, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,214

Claims priority, application Japan, July 23, 1971, 46-55517

Int. Cl. G03b *7/16*

U.S. Cl. 354—27 **7 Claims**



1. A photographic camera having automatic exposure control means for controlling exposure during normal photography and flash photography, comprising:

first diaphragm means for adjusting the phototaking aperture;

photoelectric converter means for metering the brightness of an object to be photographed;

second diaphragm means positioned in front of said converter means and mechanically linked to said first diaphragm means to provide an aperture for said converter means proportional to said phototaking aperture;

electronic time limit means for effecting a time limiting operation in response to the output of said photoelectric converter means, said time limit means including a time limiting capacitor, a switching circuit changed over by the voltage of said capacitor, and an electromagnetic means for closing a shutter controlled by the output of said switching circuit;

distance information means for providing an electronic output corresponding to the object distance;

indicator means selectively connected with said photoelectric converter means or the distance information means by a change-over means hereinafter referred to and including an indicating member arranged to be displaced in response to an electric signal;

scanning means for scanning said indicating member, said scanning means being associated with said first diaphragm means to adjust the aperture thereof in accordance with the amount of displacement of said indicating member;

scale means carrying thereon indices for indicating F-number and shutter time by reference to said indicating member; and

change-over means manually operable to provide flash photography and normal photography settings, which is selectively associated directly with the first diaphragm means and thereby with said second diaphragm means only in normal photography to adjust the respective apertures thereof manually to a selected value, whereby said converter means is conditioned to adjust the shutter time in accordance with the selected value of aperture of the first diaphragm means,

said change-over means having electrical switching means for connecting said indicating means with said photoelectric converter means only before shutter release to show the shutter time value and disconnecting it therefrom after shutter release in normal photography and for providing connection of said indicating means with said distance information means and disconnecting it substantially from the converter means to provide a proper aperture value in accordance with an object distance through the scanning means in flash photography.

3,886,569
SIMULTANEOUS DOUBLE DIFFUSION INTO A SEMICONDUCTOR SUBSTRATE

Jagtar S. Basi, Wappingers Falls, and Jagtar S. Sandhu, Fishkill, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 5,076, Jan. 22, 1970, Pat. No. 3,748,198.
This application Mar. 29, 1973, Ser. No. 346,237
Int. Cl. H01l *7/00*

U.S. Cl. 357—54 **3 Claims**

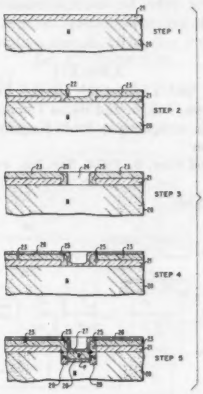
1. A semiconductor structure comprising:

a semiconductor substrate;

a first silicon oxide layer on a surface of said substrate comprising the oxide of a first-type conductivity-determing impurity; and

one or more additional silicon oxide layers, at least one of said additional layers containing the oxide of an opposite-type conductivity-determining impurity, said first-type and said opposite-type impurities having different diffusivity rates in the semiconductor substrate,

the concentration of the oxide of said first-type conductivity-determining impurity and the concentration of the oxide of said opposite-type conductivity-determining impurity being such that upon heating at diffusion temperatures in the order of 1050° C, regions of said first-type and said opposite-type conductivity respectively



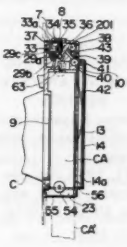
having concentrations of at least 10^{16} atoms/cm^3 will form a junction in the substrate below said first and additional layers.

3,886,570
AUTO-PROCESS CAMERA

Yoshio Asano, Hyogo, and Kinji Ohkubo, Minami Ashigara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-Shi, Japan

Filed Feb. 13, 1974, Ser. No. 442,256
Claims priority, application Japan, Feb. 13, 1973, 48-17709
Int. Cl. G03b *17/50*

U.S. Cl. 354—86 **8 Claims**



1. An auto-process camera comprising:

a mounting portion for accomodating a film cassette containing a plurality of monosheets to be successively brought to a foremost position for exposure to light through a camera lens,

means for extracting exposed monosheets from said film cassette,

means for simultaneously advancing and processing the exposed monosheets removed from said cassette by said extracting means,

a pocket for accommodating the processed monsheets,

means for directing the processed monosheets from said advancing and processing means into said pocket, said directing means comprising a feed roller means for feeding the processed monosheets into said pocket, and

guide means for receiving the processed monosheets from said advancing and processing means and subsequently

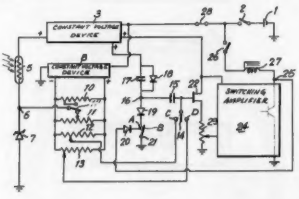
directing exposed monosheets to said feed roller means, said camera further comprising switch means for detecting the feeding of a monosheet by said feed roller means into said pocket and for stopping said feed roller means after a time delay to insure complete insertion of said monosheets into said pocket.

3,886,571

ELECTRIC SHUTTER CONTROLS FOR CAMERAS

Seinan Miyakawa, Tokyo, and Hisao Tanaka, Fukuoka-Machi, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Mar. 5, 1974, Ser. No. 448,217
Int. Cl. G03b *7/08, 9/62*
U.S. Cl. 354—234 **14 Claims**



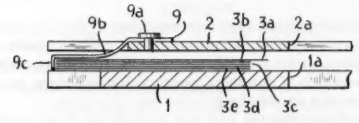
1. In a control circuit for a camera shutter activated by the operation of a shutter release mechanism of the camera, electromagnetic means for closing the shutter to terminate an exposure, energizing circuit means electrically connected to said electromagnetic means and including mechanical switch means operative in response to said shutter release operation for establishing a first exposure time of short duration, switching circuit means electrically interconnected to said electromagnetic means for automatically determining a second exposure time in accordance with exposure determining factors, and a pair of forward-biased diode means connected respectively in said energizing circuit means and said switching circuit means for establishing separate automatic timed control of said electromagnetic means by both said energizing circuit means and said switching circuit means.

3,886,572

SHUTTER ASSEMBLY HAVING MEANS FOR SEQUENTIALLY BRAKING AND STOPPING SHUTTER BLADES

Eiichi Onda, Misato; Mitsuo Koyama, and Tadashi Nakagawa, both of Yotsukaido, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Aug. 27, 1973, Ser. No. 391,528
Claims priority, application Japan, Aug. 25, 1972, 47-98404
Int. Cl. G03b *9/26*
U.S. Cl. 354—252 **7 Claims**



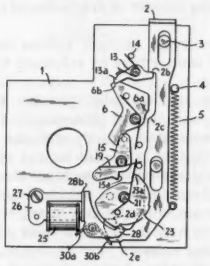
1. A shutter assembly for a camera comprising: means defining a shutter aperture; a plurality of actuatable shutter blades comprising a first group of shutter-opening shutter blades actuatable through a working stroke from an extended position wherein they close said shutter aperture to a retracted position wherein they open said shutter aperture, and a second group of shutter-closing shutter blades actuatable through a working stroke from a retracted position wherein they open said shutter aperture to an extended position wherein they close said shutter aperture; shutter actuating means for sequentially actuating the first and second shutter blade groups to effect first opening and then closing of said shutter aperture thereby defining an exposure; and combined braking-stopping means separate and distinct from said shutter actuating means and having a frictional braking portion and a subsequently effective stopping portion both disposed along the path of travel of the same end portions of the shutter blades within at least one of said first and second shutter blade groups for sequentially braking the motion of said shutter blades by said frictional braking portion as they near completion of their working stroke and effecting precise stoppage of said shutter blades directly by said stopping portion at a predetermined stop position at the end of their working stroke.

3,886,573

ELECTROMAGNETIC CONTROL DEVICE FOR ELECTRICALLY-OPERATED SHUTTER

Masuo Ogihara, and Masanori Watanabe, both of Chiba, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Sept. 10, 1973, Ser. No. 395,589
Claims priority, application Japan, Sept. 11, 1972, 47-105074
Int. Cl. G03b *9/62*
U.S. Cl. 354—258 **3 Claims**



1. In an electrically-operated camera shutter having a shutter-operating mechanism for selectively opening and closing the shutter, a control circuit comprising an electromagnet energized for releasably holding the shutter-operating mechanism in a condition in which the shutter is open and allowing closing of the shutter when de-energized, control means coactive with said shutter-operating mechanism comprising an armature attracted by said electromagnet when energized for releasably holding said shutter-operating mechanism in said open condition, a biasing spring constantly biasing said armature in a direction toward an operative position corresponding to its attracted position thereof when attracted by said electromagnet and resisting closing of said shutter of said shutter-operating mechanism, means operable for initiating opening of the shutter for taking an exposure and for rendering said spring ineffective before said opening of the shutter is initiated.

3,886,574

CAMERA AND CARTRIDGE

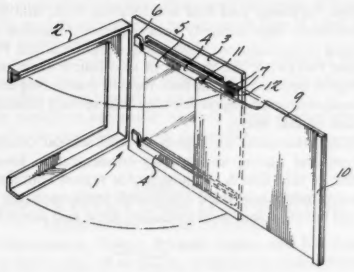
Jung Hwan Na, 151-22, Hwa Yang Dong, Sung Dong Ku, Seoul, South Korea

Filed Aug. 16, 1973, Ser. No. 389,884
Claims priority, application South Korea, May 21, 1973, 883/73
Int. Cl. G03b *17/26*
U.S. Cl. 354—284 **3 Claims**

1. A film cartridge comprising:
a base plate,
a least one U-shaped clip member attached at one end to said plate and urging a film piece against said plate,
at least one piece of soft material fixed to said plate opposite the U-shaped end of said clip member,

a magnetic frame member of L-shaped cross section side fixed at the end to one side of said base plate and a long side extending parallel to said base plate, said frame member defining an exposure window,

a shieldplate disposed for sliding movement between said frame member and said clip member and having at one



end a handle portion for manually exerting a force to effect said sliding movement and at the other end a stop portion and

at least one stop member on said clip member adjacent said U-shaped end for engaging said stop portion and preventing complete withdrawal of said plate.

3,886,575

APPARATUS FOR TREATING PHOTOGRAPHIC MATERIAL IN CLOSED CASSETTES

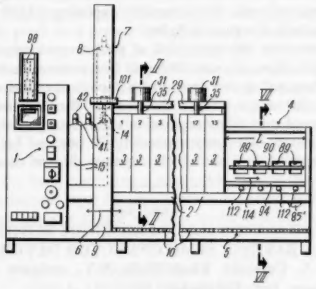
Kurt Gall, Welfenstrasse 22, 7 Stuttgart-Birkach, Germany

Filed Sept. 12, 1973, Ser. No. 396,429

Claims priority, application Germany, Sept. 13, 1972, 2244860

Int. Cl. G03d *3/00*

U.S. Cl. 354—311 **20 Claims**



1. An apparatus for treating photographic material comprising:

a plurality of upwardly open vessels arranged in a row for treating of said material with respective liquids;

a film-containing cassette having a closed housing having a bottom formed with at least one liquid-traversable opening affording access of said liquids to said material in said housing,

blocking means for preventing light from entering said housing through said opening and including a plurality of overlapping baffle vanes at said opening, and at least one outwardly open tube at said bottom with an inner end terminating inwardly of said baffle vanes and provided with a spray manifold; and

transport means displaceable along said row of said vessels for immersing said cassette successively therein.

3,886,576

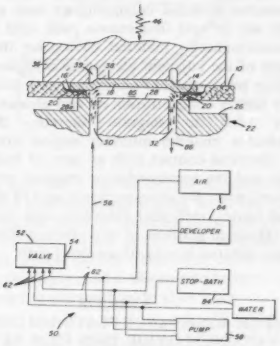
METHOD AND APPARATUS FOR PROCESSING A FILM INSERT ON AN APERTURE CARD

Donald J. Stoffel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 309,311, Nov. 24, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,241

Int. Cl. G03d *5/00*

U.S. Cl. 354—317 **9 Claims**



1. Apparatus for processing an exposed photographic emulsion layer on one side of a film member mounted on a compressible aperture card with the emulsion side of the film member facing and overlying the card aperture, said aperture card being normally subject to damage by the wetting effects of contact with a processing liquid, said apparatus comprising:

a. a processing receptacle having a sealing member arranged to contact a portion of such a card bordering the aperture, on the side of the card opposite the film member, to form a processing chamber defined partially by an edge portion of the card bordering the aperture and partially by the exposed emulsion layer;

b. means for compressing such a card against said sealing member to render said aperture-edge portion of the card substantially impervious to processing liquid; and

c. means for supplying processing liquid to said processing chamber to process the exposed emulsion layer of such a card.

3,886,577

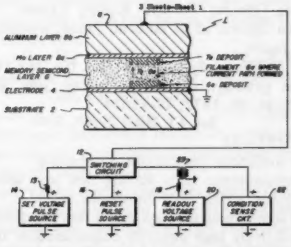
FILAMENT-TYPE MEMORY SEMICONDUCTOR DEVICE AND METHOD OF MAKING THE SAME

William D. Buckley, Troy, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Sept. 12, 1973, Ser. No. 396,497

Int. Cl. H01l *19/00*

U.S. Cl. 357—2 **18 Claims**



1. A switch device which includes a pair of spaced electrodes between which extends a body of generally amorphous

substantially non-conductive semiconductor material made of a composition of at least two elements, said composition when a set voltage pulse in excess of a given threshold level is applied to said electrodes for a given period becoming conductive as current flows through a filamentous path therein, and when D.C. current pulses of at least a given amplitude and duration are fed through said filamentous path, there can occur in said path migration of the more electropositive element of said composition to the negative electrode and the more electronegative element to the positive electrode, said semiconductor material occupying an area at least several times the size of said filamentous path, said body of amorphous semiconductor material having on the side thereof facing one of the adjacent electrodes a region including the termination point of said filamentous path containing a substantially higher concentration of said element which would normally tend to migrate thereto, the electrode-semiconductor material interface region extending to and making electrical contact with an area of both the adjacent electrode and the semiconductor material which area is at least several times the cross-sectional area of said filamentous path and having sufficient thickness and concentration to effect a stabilized gradient of said element through the semiconductor material in said filamentous path.

3,886,578

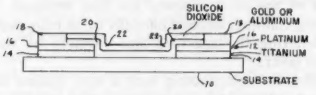
LOW OHMIC RESISTANCE PLATINUM CONTACTS FOR VANADIUM OXIDE THIN FILM DEVICES

H. Keith Eastwood, Beaconsfield, Quebec; Barry A. Noval, Cote-St-Luc, Quebec; Marcus Arts, Lonqueuil, Quebec, and Michael Leitner, Dollard Des Ormeaux, Quebec, all of Canada, assignors to Multi-State Devices Ltd., Quebec, Canada

Filed Feb. 26, 1973, Ser. No. 335,651

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 357—4 **8 Claims**



1. A thin film device having a low ohmic contact resistance comprising:

a. a plate-like substrate of electrically insulating material;

b. spaced platinum contacts deposited on the surface of said substrate; and

c. a thin film of vanadium oxide having a thickness of from 1000 to 5000 A deposited over said substrate and bridging a portion of said spaced platinum contacts, said vanadium oxide having an ohmic contact resistance which is lower than 10 ohms and having a good adhesion with said platinum contacts.

3,886,579

AVALANCHE PHOTODIODE

Hirobumi Ohuchi; Tatsuya Kamei; Kiyoshi Tsukuda, and Takuzo Ogawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed July 24, 1973, Ser. No. 382,188

Claims priority, application Japan, July 28, 1972, 47-75095; Sept. 20, 1972, 47-93624

Int. Cl. H01l *29/90, 9/00*

U.S. Cl. 357—13 **10 Claims**

1. An avalanche photodiode comprising:

a semiconductor body having first and second principal surfaces, which body comprises

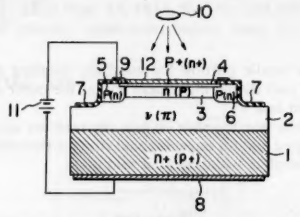
a first semiconductor region of a first conductivity type and a relatively high impurity concentration, one surface of which forms said first principal surface of said body;

a second semiconductor region of said first conductivity type and an impurity concentration lower than that of said first semiconductor region disposed on said first semiconductor region;

a third semiconductor region of said first conductivity type and having an impurity concentration lower than that of said first region and higher than that of said second region disposed on said second semiconductor region;

a fourth semiconductor region of a second conductivity type, opposite said first conductivity type, and having a relatively high impurity concentration, disposed on said third semiconductor region and defining a first PN junction therewith, the surface of said fourth semiconductor region opposite the surface thereof contacting said third semiconductor region forming said second principal surface of said body;

a fifth semiconductor region of said second conductivity type and having an impurity concentration lower than that of said fourth semiconductor region contacting and surrounding said third and fourth semiconductor regions and having a thickness extending from said second principal surface of said body to beyond the interface of said second and third semiconductor regions and defining a second PN junction with said second and third semiconductor regions, which second PN junction has a breakdown voltage higher than that of said first PN junction;



a first electrode disposed on said first principal surface of said semiconductor body; and

a second annular-shaped electrode disposed on a peripheral portion of said fourth semiconductor region above said first PN junction, at the second principal surface of said semiconductor body thereby exposing said fourth semiconductor region to light;

and wherein the thickness of said second semiconductor region between said fifth and first semiconductor regions is larger than the spread of a depletion region within said second region, while the sum of the thickness of said second and third regions is such that said diode has a quantum efficiency exceeding 50 percent for the wavelength of the light which impinges on said diode.

3,886,580

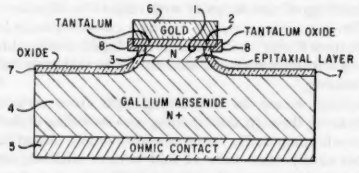
TANTALUM-GALLIUM ARSENIDE SCHOTTKY BARRIER SEMICONDUCTOR DEVICE

Joseph A. Calviello, Kings Park, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 9, 1973, Ser. No. 404,303

Int. Cl. H01l *3/20*

U.S. Cl. 357—15 **1 Claim**



1. A Schottky barrier semiconductor device comprising a body of gallium arsenide, a metal electrode in contact with

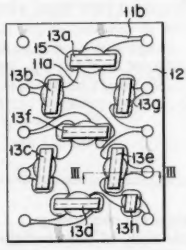
said body to form therewith a Schottky barrier, and a passivation film covering at least the parts of said body and said electrode in the region of the periphery of said barrier, characterized in that

a. said electrode is of tantalum,
b. said passivation film that covers said body is native oxide of gallium arsenide,
c. said passivation film that covers said electrode is tantalum oxide in contact with said native oxide film in close proximity to the edge of said barrier,
d. the surface region of gallium arsenide adjacent the periphery of said barrier is approximately perpendicular to the plane of said barrier, and
e. said tantalum electrode extends along said plane outwardly beyond said barrier periphery.

3,886,581
DISPLAY DEVICE USING LIGHT-EMITTING SEMICONDUCTOR ELEMENTS

Hiroshi Katsumura, Tokyo; Hiroshi Fujita, and Kei Kaneda, both of Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Dec. 21, 1973, Ser. No. 427,216
Claims priority, application Japan, Dec. 28, 1972, 48-3025
Int. Cl. H05b *33/10*
U.S. Cl. 335—17 **11 Claims**



1. A display device comprising an insulation base plate; a plurality of light-emitting semiconductor elements arranged on the base plate in a prescribed pattern, each of said semiconductor elements having a P-N junction and electrodes formed on both surfaces so disposed as to face the P-N junction, said semiconductor elements each being disposed to the base plate with the P-N junction disposed nonparallel to the base plate; an organic electric insulation adhesive layer covering part of the exposed P-N junction plane of the semiconductor element so as to fix it to the base plate; a conductive layer printed on the base plate; and a connector laid on the electric insulation adhesive layer for electrical connection of the electrodes of the semiconductor element to the conductive layer.

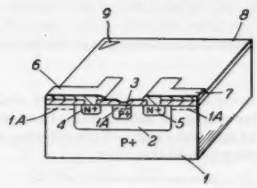
3,886,582
FIELD EFFECT TRANSISTOR

Kazuyoshi Kobayashi, and Katsuhiko Akiyama, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 241,310, April 5, 1972, abandoned.
This application Jan. 2, 1974, Ser. No. 430,081
Int. Cl. H01l *11/14*
U.S. Cl. 357—22 **2 Claims**

1. A field effect transistor comprising a substrate of silicon of one conductivity type, a second region of opposite conductivity type diffused into said first region forming a first pn junction therebetween, a third high impurity region of the first conductivity type diffused into said second region forming a second pn junction therebetween and having a thin channel between said first and third regions, opposite end regions of said channel rising to the surface of said substrate and providing source and drain regions of high secondtype impurity concentration, a gate electrode on said third region, a thermally grown silicon dioxide layer formed on the upper surface of said substrate and said second region overlying the surface termination of said first and second pn junctions and leaving at least a portion of said surface of said substrate and said third region free, a low-temperature silicon dioxide glass layer formed on the remaining upper surface portion of said substrate not covered by said thermally grown silicon dioxide

PRIOR ART

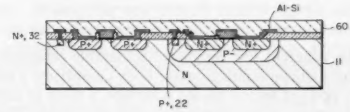


layer including said free surfaces of said substrate and said third region, said low-temperature glass layer also covering said thermally grown layer, a phosphorus-silicon glass layer covering said low-temperature silicon dioxide glass layer, a low-temperature silicon dioxide glass layer cover said phosphorus-silicon glass layer, and a silicon nitride layer covering said low-temperature silicon dioxide glass layer.

3,886,583
INSULATED GATE-FIELD-EFFECT TRANSISTOR

Raymond C. Wang, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 158,723, July 1, 1971, abandoned.
This application Oct. 23, 1973, Ser. No. 408,984
Int. Cl. H01l *11/14*
U.S. Cl. 357—23 **2 Claims**



1. An MOSFET device comprising, in combination P-type substrate, a N-type source region, an N-type drain region and an aluminum-silicon gate electrode therebetween, the threshold voltage of said MOSFET device being at least 0.5 volts less than an otherwise identical MOSFET device having a pure aluminum gate electrode, and aluminum-silicon metal electrode contacts to said source and drain regions of said MOSFET device.

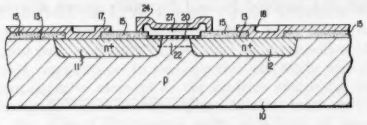
3,886,584
RADIATION HARDENED MIS DEVICES

Koy B. Cook, Jr., Satellite Beach; Jimmy L. Davidson; Joseph D. Gibson, both of Melbourne Beach, and Raymond B. Patterson, III, Eau Gallie, all of Fla., assignors to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 92,074, Nov. 23, 1970, abandoned.
This application Jan. 30, 1973, Ser. No. 328,032
Int. Cl. H01l *5/06*
U.S. Cl. 357—23 **6 Claims**

1. An insulated-gate field-effect transistor, comprising
a silicon body having a preselected conductivity type and having a major planar surface,
a pair of spaced-apart source and drain regions of opposite conductivity type from said preselected conductivity type, extending into said silicon body from said major surface thereof and defining a channel for charge carriers therebetween closely adjacent said major planar surface, and

a gate electrode overlying said channel and separated from said major planar surface thereat at least in part by a gap, said gate electrode being of generally rectangular shape with long sides and relatively shorter ends, said gate



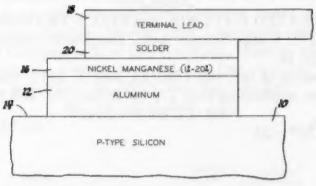
electrode being supported along both of said long sides, said gap remaining of substantially fixed width during operation of said transistor and contributing to the radiation hardening of said transistor.

3,886,585

SOLDERABLE MULTILAYER CONTACT FOR SILICON SEMICONDUCTOR

Mark L. Konantz, and Ronald K. Leisure, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed July 2, 1973, Ser. No. 375,688
Int. Cl. H01l *6/00*
U.S. Cl. 357—67 **2 Claims**



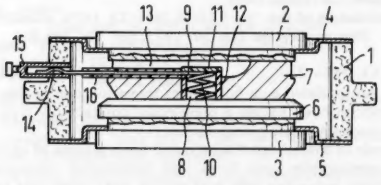
1. An adherent low resistance solderable multilayer electrode on a silicon semiconductor body comprising a semiconductive body of silicon having a surface, a layer of aluminum on said surface in low electrical resistance contact therewith, and a nickel alloy layer on said aluminum layer at least about 3,000 angstroms thick, said nickel alloy layer consisting essentially of nickel and about 1– 20% by weight manganese.

3,886,586

THYRISTOR HOUSING ASSEMBLY

Walter Bahlinger; Werner Egerbacher, and Heinz Martin, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 14, 1973, Ser. No. 397,403
Claims priority, application Germany, Sept. 21, 1972, 2246423
Int. Cl. H01l *11/00*
U.S. Cl. 357—79 **3 Claims**



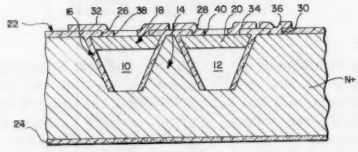
1. A thyristor with a disc-shaped housing comprising an insulating ring, two metal cover plates connected in gas tight fashion to said ring, a semiconductor element having an ignition electrode, a control line having one end passing into an opening in said housing, and its other end resting on said ignition electrode, a metal plate arranged between one of the cover plates and said semiconductor element, said metal plate having a recess for the other end of said control line, one of the metal housing components having a slot therein in which is arranged at least a part of the control line, in said slot opening into said recess, said recess being provided with an abutment on said metal plate facing said semiconductor element, the end of the control line which rests on said ignition electrode being designed as a coil spring disposed in compression against said igniton electrode and against said abutment, and means for clamping said control line inclcuding said spring to said metal plate including an elastic insulating ring having an outer surface in engagement with the surface of said recess and an inner surface embracing said spring, and an insulating cap between said spring and said abutment.

3,886,587

ISOLATED PHOTODIODE ARRAY

Hugh Crawford Nicolay, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed July 19, 1973, Ser. No. 380,611
Int. Cl. H01l *15/00*
U.S. Cl. 357—49 **5 Claims**



1. A photodiode array comprising:

a semiconductor body of polycrystalline structure of one type conductivity having a planar surface;

a first plurality of spaced apart photosensitive single crystal planar regions of semiconductor material of opposite conductivity type to said one conductivity type, said first plurality of planar regions having a top, bottom and lateral surfaces, said bottom and lateral surfaces being surrounded by said body and said top surface being substantially coplanar with said planar surface;

a corresponding second plurality of single crystal buried regions of semiconductor material of said one conductivity type having a top, bottom and lateral surfaces, said top surfaces of said buried region being adjacent said bottom surface of a corresponding planar region, said lateral surface of said buried region being surrounded by said body and said bottom surface of said buried region being adjacent said body;

a plurality of first insulating barriers extending from said planar surface to said bottom of said second plurality of buried regions and separating said polycrystalline body and said lateral surfaces of said first and second plurality of regions.

3,886,588

CHROMA GENERATOR FOR CHARACTER DISPLAY

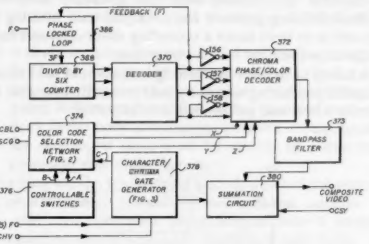
James A. Dalke, Bellevue, Wash., assignor to Metro Data Corporation, Seattle, Wash.

Filed Sept. 14, 1973, Ser. No. 397,250
Int. Cl. H04n *9/02*
U.S. Cl. 358—82 **5 Claims**

1. A chroma generator suitable for use in a character display system comprising:

frequency generating means for generating a plurality of binary digital signals all at a suitable TV subcarrier frequency but being out of phase with one another;

a chroma phase/color decoder suitable for receiving said plurality of binary digital signals and selecting one of said binary digital signals for application to an output; and,



bandpass filter means connected to the output of said chroma phase/color decoder for eliminating unwanted frequency components from the digital output of said chroma phase/color decoder.

3,886,589

VIDEO RECORDING SYSTEM FOR REDUCING FLICKER IN THE SKIP FIELD MODE

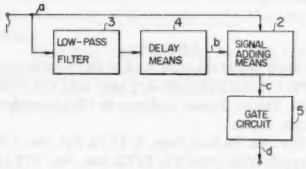
Takuya Nasu, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Japan

Filed Sept. 4, 1973, Ser. No. 394,271

Claims priority, application Japan, Sept. 13, 1972, 47-92668; Nov. 25, 1972, 47-118401; July 13, 1973, 48-79698; July 13, 1973, 48-79699

Int. Cl. H04b *5/78*

U.S. Cl. 360—11 **7 Claims**



1. A video recording system comprising a signal terminal to which an original television signal to be recorded is applied, delay means for delaying a portion of said original television signal applied to said signal terminal by an amount equal to a certain integer times a field period of each original television signal, means for producing a mixed television signal by adding a delayed television signal from said delay means to said original television signal, means for successively sampling fields from said mixed television signal, each of said samples being taken at an interval of a certain integer times one field, and means for recording the sampled television fields.

3,886,590

MULTI-MESSAGE ANNOUNCING SYSTEM

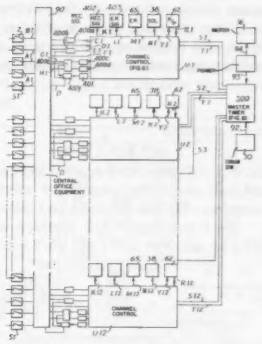
Walter P. Walker, Atlanta; Leary W. Smith, Chamblee; Frank H. Cofer, Jr., and Jack E. Lewis, both of Atlanta, all of Ga., assignors to The Audichron Company, Atlanta, Ga.

Continuation of Ser. No. 140,195, May 4, 1971, abandoned. This application Sept. 11, 1973, Ser. No. 396,155

Int. Cl. G11b *5/54, 5/76, 19/12*

U.S. Cl. 360—12 **10 Claims**

1. In a message announcing system, a first message medium for storing a first message, a first message announcing means operative in response to a first operating signal to provide a message output in response to said first message, a second message medium for storing a second message, a second message announcing means operative in response to a second operating signal to provide a message output in response to said second message, a motion means for continuously moving both said first message medium and said second message medium relative to both said first message announcing means and said second message announcing means, a control means operative to provide a first control signal at a first predetermined time in response to said first message medium and said first message announcing means having a predetermined position relative to each other, and also operative to provide a second control signal at a second predetermined time in response to said second message medium and said second message announcing means having a predetermined position relative to each other, and operating means connected to be responsive to said first and second control signals and also responsive to a first message signal and a second message signal, said operating means being operative to supply said first operating signal to said first message announcing means in response to the occurrence of both said first control signal and said first message signal, and being operative to supply said second operating signal to said second message announcing means in response to the occurrence of both said second control signal and said second message signal.



3,886,591

CASSETTE TAPE APPARATUS WITH AUTOMATIC CHANGER

Giuseppe Bettini, Ivrea, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea (Turin), Italy

Filed May 15, 1973, Ser. No. 360,696

Claims priority, application Italy, May 13, 1972, 68506/72

Int. Cl. G11b *23/12*

U.S. Cl. 360—92 **6 Claims**

1. In a cassette tape apparatus having a station at which a cassette containing magnetic tape can be recorded and/or played back, a cassette changer comprising:

a loading magazine wherein cassettes to be used are stacked,

a collecting magazine adapted to stack used cassettes therein, said loading and collecting magazines having horizontal bottom planes adapted to support the lowermost stacked cassette thereon, said station being disposed between said loading and said collecting magazines in a station plane below said bottom planes,

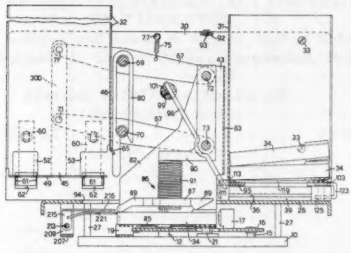
a container movable between said bottom planes and said station plane,

means for moving the movable container to align same with said bottom planes when a used cassette is to be replaced, means coupling the bottom plane of said collecting magazine to said movable container to raise said collecting

magazine as said container moves into said station plane and to lower said collecting magazine as said container moves to said bottom planes wherein the stroke of the bottom plane of said collecting magazine exceeds the thickness of a cassette whereby said bottom planes and said container are aligned when the bottom plane of said collecting magazine is lowered and said container is raised,

means for preventing the used cassettes stacked in said collecting magazine from dropping as the corresponding bottom plane is lowered comprising spring loaded catches mounted to coact with the lowermost one cassette in said collecting magazine to ride on same as the bottom plane of said collecting magazine rises, and

transfer means for simultaneously transferring the lowermost one of the cassettes to be used from said, loading magazine to said container and the used cassette from said movable container to said collecting magazine when



said container is aligned with said bottom plane, said transfer means comprising a slidable transfer plate mounted parallel to said bottom planes for pushing the lowermost one cassette to be used fromt said loading magazine into said container, an oscillatable arm pushing the used cassette from said container into said collecting magazine when actuated and a common drive means for actuating said transfer plate and said oscillatable arm when the bottom plane of said collecting magazine is lowered and said container is raised, said common drive means comprising a carriage, means slidably mounting the carriage for movement through a forward and a return stroke between two extreme positions comprising a fixed guide, a reversible motor for moving the carriage and a first and a second actuatable limit switch actuated in response to said carriage being in said extreme positions for respectively controlling the stopping and the reversing of the motion of said motor.

3,886,592

SAFETY SWITCH DEVICE FOR A MAGNETIC RECORDING AND REPRODUCING APPARATUS OF THE SHEET TYPE

Saburo Kato, Yokohama; Takaji Sue, Tokyo, and Tadanao Itoh, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 395,174

Claims priority, application Japan, Sept. 13, 1972, 47-106848[U]

Int. Cl. G11b *19/08;* **H01h** *9/20*

U.S. Cl. 360—75 **5 Claims**

1. In magnetic recording and reproducing apparatus comprising

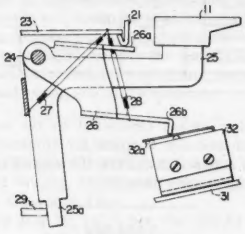
a. a housing having an upper surface for supporting a magnetic recording sheet in a stationary position;

b. means for performing magnetic recording and reproducing operations on a downwardly facing surface of a recording sheet supported on said housing upper surface;

c. manually operable means for actuating said recording and reproducing means; and

d. a plate, having a first end hingedly connected to said housing and a second, free end, said plate being hingedly movable downwardly into and upwardly away from a sheet-holding position for overlying said housing upper surface to hold down a recording sheet disposed thereon; the improvement which comprises:

e. a safety switch for permitting actuation of said recording and reproducing means by said manually operable means only when said safety switch is actuated;



f. a hook projecting downwardly from said plate adjacent the free end thereof;

g. said housing having an opening through which said hook projects when said plate is in sheet-holding position;

h. a member for engaging said hook within said opening to retain said plate in sheet-holding position; and

i. a lever mounted within and shielded from external manual access by said housing for actuating said safety switch and disposed to be engaged and moved by said hook, when said hook is inserted through said opening, to actuate said safety switch.

3,886,593

DEVICE FOR AUTOMATICALLY INTERCHANGING TAPE CASSETTES IN A TAPE RECORDER

Masaaki Sato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

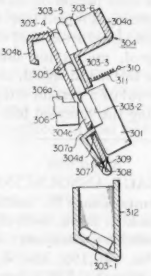
Division of Ser. No. 70,864, Sept. 9, 1970, Pat. No. 3,765,684.

This application June 18, 1973, Ser. No. 371,165

Claims priority, application Japan, Sept. 11, 1969, 44-71625; Sept. 11, 1969, 44-71626

Int. Cl. G11b *23/12*

U.S. Cl. 360—92 **6 Claims**



1. Recording apparatus comprising, in combination:

a. a body portion carrying a spindle rotatable about an axis;

b. a cassette supporting deck axially movable on said body portion between an operative and an inoperative position and adapted releasably to engage a tape cassette for joint movement between said positions, the jointly

moving cassette being engaged by said spindle in the operating position of said deck;

c. yieldably resilient means biasing said deck toward said inoperative position;

d. cassette supplying means including

a storing member adapted to receive a stack of tape cassettes, and

2. a chute member communicated with said storing member for receiving a terminal cassette of a stack received in and storing member, said chute member being elongated downward from said storing member toward said deck in the normal operating position of said apparatus for downward movement by gravity of a cassette received in said chute member;

e. limiting means for limiting said downward movement in a predetermined position of said terminal cassette,

1. said chute member being formed with a transverse aperture dimensioned for passage of said deck,

2. said chute member being mounted for pivotal movement toward and away from a first position in which said deck, when in the inoperative position, extends through said aperture into said chute member for engagement with said terminal cassette in said predetermined position of the cassette;

f. operating means for pivoting said chute member toward and away from said first position thereof, and for thereby moving the engaged cassette jointly with said deck into the operative position of said deck when said chute member is pivoted from said first position to a second position thereof by said operating means; and

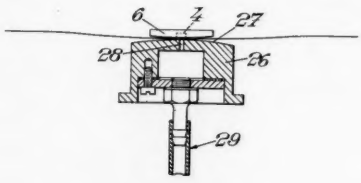
g. releasing means for releasing said terminal cassette from said limiting means for further movement outward of said chute member.

3,886,594

FLEXIBLE DISC MEMORY DEVICES

Michel Toussan, Ermont, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique S A G E M, France

Filed July 26, 1973, Ser. No. 382,751
Claims priority, application France, Aug. 7, 1972, 72.28463
Int. Cl. G11b *5/60*
U.S. Cl. 360—102 **12 Claims**



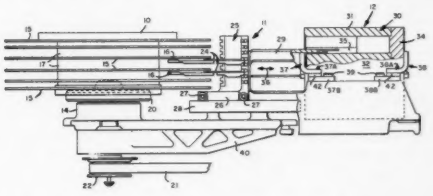
1. Flexible disc memory device, comprising at least one flexible disc cooperating with a rotary drive means and of which one at least of the two surfaces has a coating of magnetic material, and at least one recording and reading head positioned to record information on this magnetic coating and/or to read the information occurring on said magnetic coating, said device comprising a fixed reference part arranged essentially parallel and close to the plane of the flexible disc, said reference part being oriented radially and having a convex surface opposite the corresponding surface of the flexible disc, said convex surface shaped such that a radial plane which includes the axis of rotation of the disc intersects this surface along a straight line and a tangential plane perpendicular to the radial plane intersects this surface along a convex curve, said reference part having a radially extending orifice means on its convex surface, comprising at least one orifice connected to pressurised gas supply means for delivering a gaseous flow in the form of a radially extending curtain directed towards the flexible disc such that the gas impinges on the disc and then flows tangentially along both sides of the reference part, the recording and reading head of said device being situated on the side of the flexible disc opposite from the reference part.

3,886,595

ACTUATOR FOR A DISC DRIVE APPARATUS

Ronald L. Swaim, Sunnyvale; John Cuda, San Jose, and Timothy W. Martin, Los Altos, all of Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.

Filed Feb. 13, 1974, Ser. No. 442,071
Int. Cl. G11b *5/48, 25/04*
U.S. Cl. 360—106 **5 Claims**



1. In a data storage apparatus for transferring data to or from a memory device by interaction between a read/write head and the memory device,

a baseplate

means for supporting the memory device on the baseplate, means for supporting the read/write head on the baseplate for movement across the memory device whereby various areas of the memory device and head are permitted to interact for transferring data therebetween,

an actuator for moving the head support means relative to the memory device, and

elastic support means having spaced surfaces fixed respectively to the baseplate and actuator to support the actuator on the baseplate in a manner permitting limited movement between the actuator and baseplate during movement of the head supporting means for positioning the head while limiting the transmission of vibratory forces between the actuator and baseplate.

DESIGN PATENTS

GRANTED MAY 27, 1975

ERRATA

For CLASS	See PATENT NO.
003–019	235,174
048–020	235,227
048–023	235,228
056–004 B	235,229
061–001 Q	235,230
064–011 B	235,231
087–005.00C	235,232

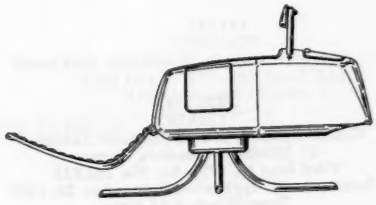
DESIGNS

MAY 27, 1975

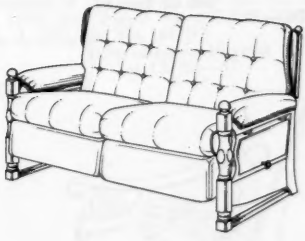
235,174
HEM MARKER
Lee R. Gardner, Elmhurst, N.Y., assignor to Dyno Merchandise Corporation, Elmhurst, N.Y.
Filed Sept. 5, 1973, Ser. No. 394,594
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D3—19

235,175
GLOVE
Leonard Berger, Ridgewood, and Thomas H. P. Jaggers, Jr., Ringwood, N.J., assignors to Rapid-American Corporation, New York, N.Y.
Filed Apr. 29, 1974, Ser. No. 465,379
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—373

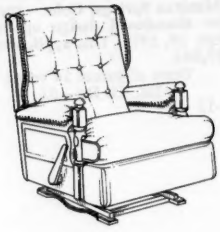
235,176
CHAIR OR SIMILAR ARTICLE
Leonard V. Wheatley, 30 Sutherland Road, Manitou Springs, Colo. 80829
Substituted for abandoned design application Ser. No. 179,603, Sept. 10, 1971. This application Feb. 4, 1974, Ser. No. 439,004
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—12



235,177
SETTEE OR SIMILAR ARTICLE
Morris F. Fisher, Carmel, Ind., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed July 23, 1973, Ser. No. 382,087
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—46

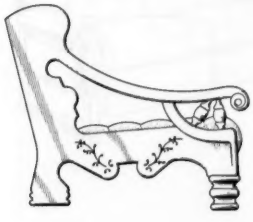


235,178
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Mohasco Corporation, Amsterdam, N.Y.
Filed July 23, 1973, Ser. No. 382,091
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



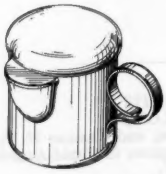
235,179
CHAIR
Charles Bernard, 18 a 30 Rue Saint Antoine, 93 Montreuil-sous-Bois, France
Filed June 14, 1972, Ser. No. 262,823
Claims priority, application France Jan. 20, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

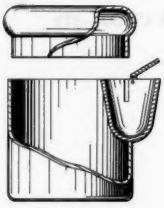
235,180
CHAIR
Evalin S. Gilbert, 2121 N. Bay Shore Drive, Miami, Fla. 33137
Filed Dec. 22, 1972, Ser. No. 317,364
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68



235,181
SUPPORT STANDARD FOR SHELVING
Eugene Brown, Rockville Centre, N.Y., assignor to Barclay Industries, Inc., Lodi, N.J.
Original design application Feb. 25, 1972, Ser. No. 229,622, now Patent No. 231,295. Divided and this application Feb. 14, 1974, Ser. No. 442,475
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—114

235,182
SUGAR CONTAINER WITH MEASURING AND DISPENSING SPOUT
Rosewell G. Capron, 5702 Lawndale, Mesa, Ariz. 85205
Filed Feb. 19, 1974, Ser. No. 443,675
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—17





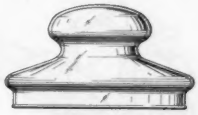
235,183
REUSABLE COFFEE-FILTER
Werner Braun, Sarnen, Switzerland, assignor to Interelectric Aktiengesellschaft
Filed Aug. 15, 1973, Ser. No. 388,555
Claims priority, application Germany Feb. 19, 1973
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47

235,184
CANISTER OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 27, 1973, Ser. No. 391,587
Term of patent 14 years
Int. Cl. D9—*02*; D7—*07*
U.S. Cl. D7—79

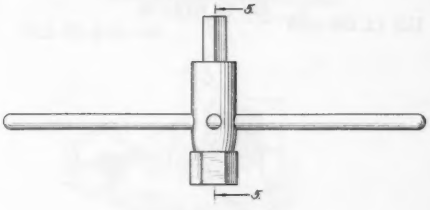
235,185
CANISTER WITH LID OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 27, 1973, Ser. No. 391,613
Term of patent 14 years
Int. Cl. D9—*02*; D7—*07*
U.S. Cl. D7—79

235,186
CANISTER WITH LID OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 9, 1973, Ser. No. 404,771
Term of patent 14 years
Int. Cl. D9—*02*; D7—*07*
U.S. Cl. D7—79

235,187
CANISTER LID OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 24, 1973, Ser. No. 409,150
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—131

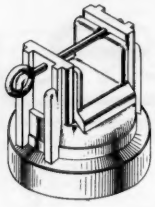


235,188
WRENCH
Franz Palfi, 122 West St., Battle Creek, Mich. 49017
Filed July 2, 1973, Ser. No. 375,627
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—29

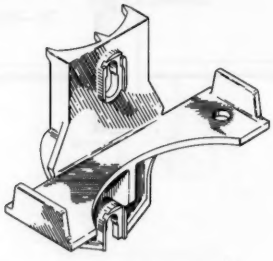


235,189
KEY
Ichiro Tachi, Fujisawa, Japan, assignor to Kabushiki Kaisha Asakusa Gangu, Tokyo, Japan
Continuation of design application Ser. No. 24,709, Aug. 26, 1970, now Patent No. 222,999. This application Aug. 3, 1971, Ser. No. 168,793
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—136

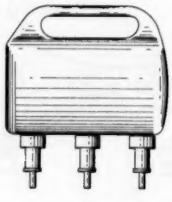
235,190
STRINGING PIN INSULATOR
Arthur W. Ross, Beverly, Mass., assignor to Synthetic Products Manufacturing Corporation, Leominster, Mass.
Filed Mar. 30, 1972, Ser. No. 239,858
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—230



235,191
UTILITY POLE SHELF CHANNEL GAIN
Joseph W. Dimiceli, 417 Eccles Ave., South San Francisco, Calif. 94080
Continuation-in-part of abandoned design application Ser. No. 273,059, July 19, 1972. This application Nov. 14, 1973, Ser. No. 415,586
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—230

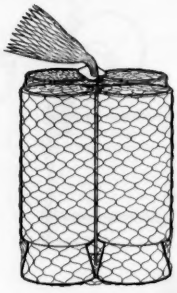


235,192
BATTERY WATER DISPENSER
Robert W. Olsen, Hinsdale, Ill., assignor to Efficiency Dispensers Corporation
Filed Mar. 26, 1973, Ser. No. 344,595
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—53



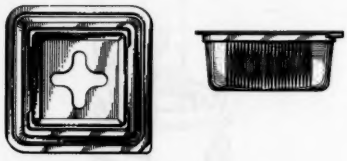
235,193
FOOD JAR OR THE LIKE
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed July 5, 1973, Ser. No. 376,752
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—140

235,194
PACKAGED SET OF BEVERAGE GLASSES
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed July 20, 1972, Ser. No. 273,393
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—193

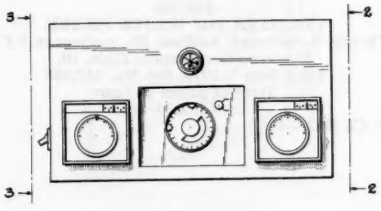


235,195
STORAGE CONTAINER
Norman O. Sauey, Jr., and Robert C. Hazzard, Portage, Wis., assignors to Portage Industries Corporation, Portage, Wis.
Filed Feb. 26, 1973, Ser. No. 336,073
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

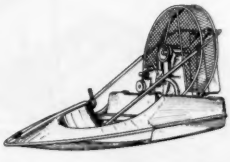
235,196
DISPENSING CONTAINER FOR FOLDED DISPOSABLE TOWELS
Kenneth W. Duhy, Mountain Lakes, and John Jones, Jr., Short Hills, N.J., assignors to Pfizer Inc., New York, N.Y.
Filed Nov. 14, 1972, Ser. No. 306,402
Term of patent 14 years
Int Cl. D9—*03*
U.S. Cl. D9—224



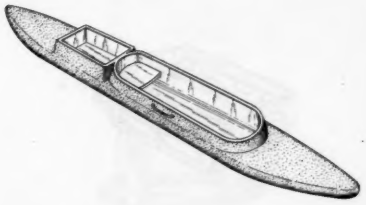
235,197
TIMER CONTROLLED DUAL THERMOSTAT
Walter A. Cross, R.D. 1, Box 203E, Rte. 88, Bristolville, Ohio 44402
Filed Sept. 27, 1973, Ser. No. 401,193
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—51



235,198
AIR DRIVEN AMPHIBIOUS VEHICLE
Brian A. Preston, 8130 Dartmouth, Hanover Park, Ill. 60103
Filed Mar. 26, 1973, Ser. No. 344,823
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—3

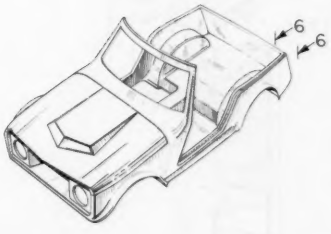


235,199
PIROGUE
Sam E. Schneider, Jr., 124 Ardmore, Shreveport, La. 71105
Filed May 22, 1973, Ser. No. 362,787
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—63

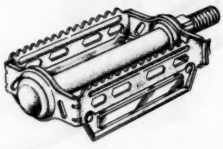


235,200
ROUND PADDLE BOAT
Carl Roberts, 6669 Charing St., Santa Susana, Calif. 93063
Filed July 19, 1973, Ser. No. 380,766
Term of patent 3½ years
Int. Cl. D12—*06*
U.S. Cl. D12—68

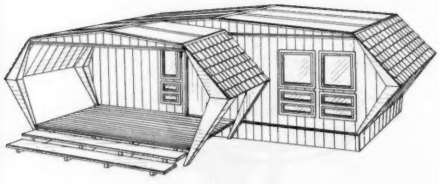
235,201
VEHICLE BODY
Thomas A. Parmley, 7233 Finebale, Downey, Calif. 90240
Filed Oct. 11, 1973, Ser. No. 405,408
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—87



235,202
REFLECTIVE RAT TRAP PEDAL
Carlton P. Pawsat and Robert F. Humlong, Maysville, Ky., assignors to Wald Manufacturing Company, Inc.
Continuation-in-part of abandoned design application Ser. No. 320,471, Jan. 2, 1973. This application May 20, 1974, Ser. No. 471,518
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—125

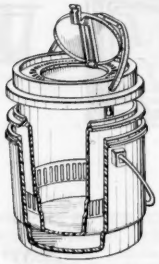


235,203
CABIN
Dennis K. Waldorf, Arkansas City, Kans., assignor to Waldorf Homes, Inc., Arkansas City, Kans.
Filed Oct. 31, 1973, Ser. No. 411,349
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A



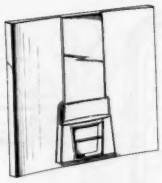
235,204
PUZZLE TOY
Charles B. Root, Morristown, N.J., assignor to Educational Design Associates
Filed Mar. 26, 1973, Ser. No. 344,737
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

235,205
BAIT BUCKET
Daniel Alan Schwartz, Long Beach, Calif., and Pasquale G. Fasulo, West Farmington, Ohio, assignors to Pendleton Tool Industries, Inc., Fullerton, Calif.
Filed Jan. 2, 1974, Ser. No. 429,756
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22

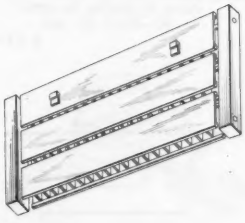


235,206
COUNTER TOP WATER FILTER
Thomas R. Bertrand, Addison, Ill., assignor to P.F.C. Financial Corporation, Elgin, Ill.
Filed June 7, 1973, Ser. No. 367,980
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

235,207
WALL PANEL FOR A BATHTUB
John A. Di Venero and Louis Curcio, Enfield, Conn., assignors to Northwood, Inc., Enfield, Conn.
Filed Sept. 24, 1973, Ser. No. 400,354
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



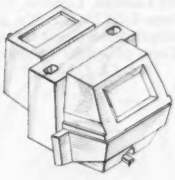
235,208
HEAT CONVECTOR
Gunnar Olaf Vestergaard Rasmussen, % Hudevad Radiatorfabrik Aktieselskab, Aarslev, Denmark
Filed June 19, 1972, Ser. No. 264,292
Claims priority, application Denmark Dec. 20, 1971
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



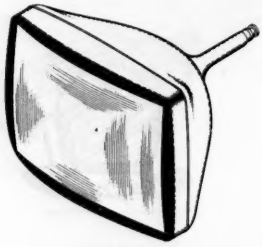
235,209
CALCULATOR WITH SLIDING TAMBOUR COVER
Karl T. Baughman, Lake Forest, Ill., assignor to Sears, Roebuck and Co.
Filed Apr. 8, 1974, Ser. No. 458,780
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

235,210
HEADPHONES
Oliver Hill, London, England, assignor to The Rank Organisation Limited, London, England
Filed Aug. 14, 1972, Ser. No. 280,414
Claims priority, application Great Britain Mar. 15, 1972
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 H

235,211
PHONOGRAPH CARTRIDGE
Robert L. Deschamps, Wheaton, Ill., assignor to Shure Brothers Incorporated, Evanston, Ill.
Filed Apr. 11, 1973, Ser. No. 350,058
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 D

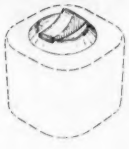


235,212
RECTANGULAR RASTER TELEVISION PICTURE TUBE
William J. Noroski, North Syracuse, and Edmund F. Schilling, Manlius, N.Y., assignors to General Electric Company
Filed Mar. 8, 1973, Ser. No. 339,191
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—14 E

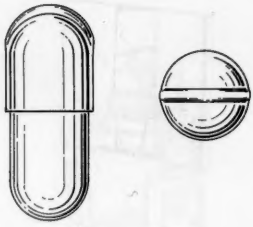


235,213
AMPLIFIER
Takeyoshi Kawano, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd.
Filed Jan. 8, 1974, Ser. No. 431,739
Claims priority, application Japan Aug. 14, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 L

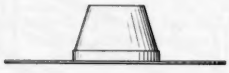
235,214
SWITCH FOR TABLE CIGARETTE LIGHTER
William Retzler, Wickham, England, assignor to Colibri Lighters Limited, London, England
Filed June 4, 1973, Ser. No. 366,567
Claims priority, application Great Britain Dec. 15, 1972
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36



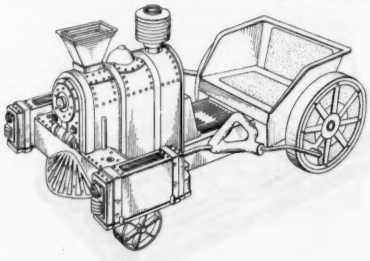
235,215
CAPSULE
Kenneth N. Larsen, Southfield, Mich., assignor to Parke, Davis & Company, Detroit, Mich.
Filed Aug. 3, 1971, Ser. No. 168,801
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D32—3



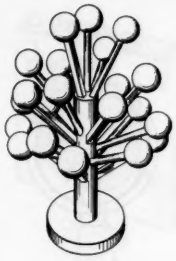
235,216
BALL GAME TARGET
Roy E. Munson, 133 Pine St., Ace, Tex. 77326
Filed Sept. 21, 1973, Ser. No. 399,323
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



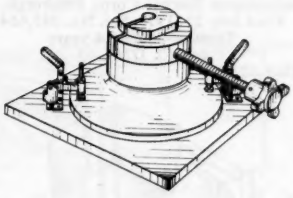
235,217
RIDER PROPELLED VEHICLE
Raymond J. Lohr, Laurie Jay Campbell, and Robert T. Auer, Erie, Pa., assignors to Louis Marx & Co., Inc.
Filed June 14, 1973, Ser. No. 370,065
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



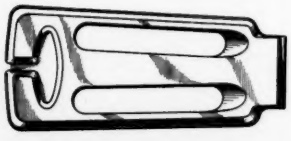
235,218
PUZZLE TOY
Mary Ann Jones, 1611 E. Washington Ave., South Bend, Ind. 46617
Filed Aug. 22, 1973, Ser. No. 390,582
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



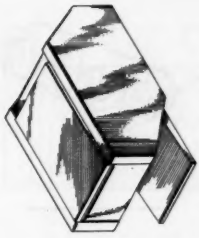
235,219
TURBO-TEARDOWN SWIVEL FIXTURE
Claude M. Harper, Westlake Village, Calif., assignor to Roto-Masters, Inc.
Filed Jan. 26, 1973, Ser. No. 327,077
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—13 A



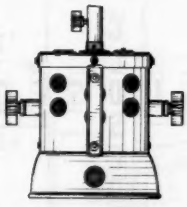
235,220
GUITAR HEAD
Hari Matsuda, Evanston, Ill., assignor to G. Leblanc Corporation, Kenosha, Wis.
Filed June 18, 1973, Ser. No. 370,772
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



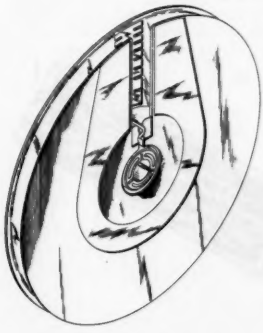
235,221
PHOTOCOPIER CABINET
Yves Cormier, 100 Rue Hoche, 72000 Le Mans, France
Filed Dec. 12, 1973, Ser. No. 424,045
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



235,222
PHOTO-LAMP
Raymond George Larson, 9731 Rainier Circle, Huntington Beach, Calif. 92646
Filed July 23, 1973, Ser. No. 381,924
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D61—1 F

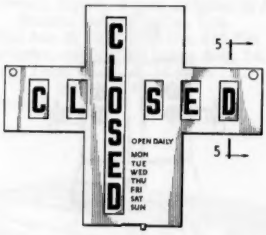


235,223
FILM REEL OR THE LIKE
Dianne Beverley Ainslie and Arthur Hunt, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 22, 1973, Ser. No. 325,287
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1 T

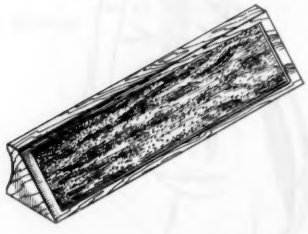


235,224
COIN HOLDER
Curtiss M. Peasley, 25 Boulder Drive, Burlington, Mass. 01803
Filed Apr. 30, 1973, Ser. No. 355,757
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—3 B

235,225
CHANGEABLE SIGN
Steven Kramar, 4052 W. 26th St., Chicago, Ill. 60623
Filed Nov. 20, 1970, Ser. No. 26,092
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12

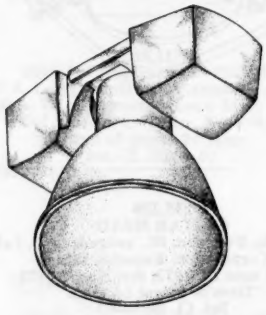


235,226
DESK NAMEPLATE
Paul W. Money, 1701 Country Lane Drive, La Porte, Ind. 46350
Filed July 23, 1973, Ser. No. 381,890
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 F

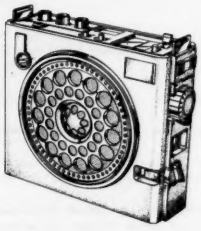


235,227
LIGHT
John M. Cleary, Martinsville, and John P. Mohrhauser, Avon-by-the-Sea, N.J., assignors to Cleary Machinery Co., Inc., Martinsville, N.J.
Filed July 9, 1973, Ser. No. 377,237
Term of patent 14 years
Int. Cl. D26—*02, 03*
U.S. Cl. D48—20 K

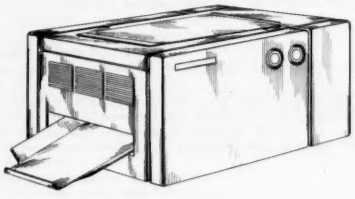
235,228
LIGHTING FIXTURE
Frank Van Steenhoven, Hudson, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed July 23, 1973, Ser. No. 381,654
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



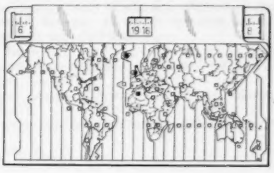
235,229
RADIO RECEIVER
Masanori Hamada, Moriguchi, and Benito Mishiro, Sakai, Japan, assignors to Matsushita Electrical Industrial Co., Ltd.
Filed Oct. 2, 1973, Ser. No. 402,855
Claims priority, application Japan Apr. 11, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B



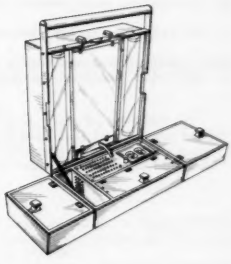
235,230
ELECTROSTATIC COPIER
Lewis H. Herr, Lansdale, and John S. Kovacs, East Norriton, Pa., assignors to Sperry Univac Division, Sperry Rand Corporation, Blue Bell, Pa.
Filed July 12, 1973, Ser. No. 378,613
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



235,231
GEOGRAPHICAL TIME CALCULATOR
Bengt Olof Mellberg, Nybodagatan 10IV, S–17142 Solna, Sweden
Filed May 4, 1973, Ser. No. 357,516
Claims priority, application Sweden Nov. 8, 1972
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D64—11 B



235,232
TRAVEL MAKE-UP CASE
Sidney E. Rickenbaker, P.O. Box 1921, Myrtle Beach, S.C. 29577
Filed Sept. 17, 1973, Ser. No. 397,917
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 C



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF MAY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Incorporated: *See—*
Helsley, Grover Cleveland, 3,886,170.

A-T-O Inc.: *See—*
Sievenpiper, Ward, 3,885,800.

AB Bofors: *See—*
Claeson, Karl Goran; Karlsson, Birgitta Gunilla; and Svendsen, Lars-Gundro, 3,886,136.

AB Gustavsbergs Fabriker: *See—*
Kosonen, Pentti Einari, 3,886,064.

Abe, Michio, to Tokai TRW & Co. Limited. Method of making ball studs. 3,885,996, Cl. 148-12.100.

Abe, Yoshio: *See—*
Naito, Takayuki; Nakagawa, Susumu; and Abe, Yoshio, 3,886,138.
Naito, Takayuki; Nakagawa, Susumu; and Abe, Yoshio, 3,886,139.

Abramovitch, Rudolph Abraham; and Cue, Berkeley Wendell, Jr. Process for the synthesis of N-hydroxypyrroles. 3,886,180, Cl. 260-326.620.

Acieries Reunies de Burbach-Eich-Dudelange S.A., ARBED: *See—*
Obst, Karl-Heinz; Stradtmann, Jurgen; Metz, Paul; and Meyer, Francis, 3,885,956.

Ackermann, Othmar, to Behringwerke Aktiengesellschaft. Intravenously tolerated anti-distemper and anti-hepatitis vaccine, its preparation and its use for immunization. 3,886,270, Cl. 424-89.000.

Acosta, Anthony L. Climbing safety device. 3,885,647, Cl. 182-8.000.

Adachi, Shizuo R.; and O'Neal, Robert G., to Borg-Warner Corporation. Damper wind stop and blade seal design. 3,885,347, Cl. 49-92.000.

Adams, Aaron W., Jr.: *See—*
Sumner, Elton; and Adams, Aaron W., Jr., 3,885,526.

Adams, Phillip: *See—*
Merianos, John J.; and Adams, Phillip, 3,886,284.

Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, to Boots Company Limited, The. Xanthenyl and thiaxanthenyl semicarbazides. 3,886,169, Cl. 260-293.580.

Addressograph Multigraph Corporation: *See—*
Anderson, Carl E., 3,885,783.

Adolph, Horst G.: *See—*
Dacons, Joseph C.; Adolph, Horst G.; and Kamlet, Mortimer J., 3,886,173.

Affiliated Hospital Products, Inc.: *See—*
Baldwin, Brian E., 3,885,560.

Agatani, Katsuzo. Inclinable bed adapted for use to medical care. 3,885,556, Cl. 128-71.000.

Agee, Robert B.; and Davis, James E., to Ethyl Corporation. Production of chlorinated hydrocarbons. 3,886,221, Cl. 260-658.00R.

Agency of Industrial Science & Technology: *See—*
Shindo, Akio; Nakanishi, Yoichiro; and Sawada, Yoshihiro, 3,886,263.

Agfa-Gevaert Aktiengesellschaft: *See—*
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Ahlstone, Arthur G., to Vetco Offshore Industries, Inc. Well casing running, cementing and flushing apparatus. 3,885,625, Cl. 166-181.000.

Ahmed, Samir A.: *See—*
Foster, Jack D.; Kirk, Russell F.; Moreno, Frederick E.; and Ahmed, Samir A., 3,886,481.

Air Products and Chemicals, Inc.: *See—*
Drage, David J., 3,885,744.
Jones, John Paul, Jr., 3,885,441.
Uffner, Melville W., 3,886,113.

Air-Tech Industries Inc.: *See—*
Fraioli, Donato M., 3,885,360.

Airwick Industries, Inc.: *See—*
Chromecek, Richard C., 3,886,125.

Ajinomoto Co., Inc.: *See—*
Yoshinaga, Fumihiro; Tsuchida, Takayasu; Kikuchi, Kenji; and Okumura, Shinji, 3,886,039.

Akerblom, Eva Birgitta, to Pharmacia Aktiebolag. N-alkylation of acylated amino compounds. 3,886,208, Cl. 260-518.00R.

Akimov, Jury Stepanovich; Galaev, Auli Alexandrovich; Gorelik, Semen Samuilovich; Gofman, Boris Izrailevich; Ermoshin, Vyacheslav Dmitrievich; Korovin, Stanislav Konstaninovich; Naumov, Vladimir Vasilievich; Preobrazhentsev, Konstantin Andreevich; Fronk, Stanislav Vladislavovich; Shvartsman, Vadim Lvovich; Garshenin, Vladimir Vasilievich; Stakhov, Oleg Fedorovich; Kruglov, Igor Ivanovich; and Samokhvalov, Mark Markovich. Method of obtaining a fused, doped contact between an electrode metal and a semiconductor. 3,886,002, Cl. 148-180.000.

Akiyama, Katsuhiko: *See—*
Kobayashi, Kazuyoshi; and Akiyama, Katsuhiko, 3,886,582.

Aktiebolaget Electrolux: *See—*
Borg, Sven Christer; Hesson, Christer Ragnar; and Nilsson, Erik Henning, 3,885,678.

Aktiengesellschaft Jungbunzlauer Spiritusund Chemische Fabrik: *See—*
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Akzo N.V.: *See—*
DeJong, Geert J., 3,886,088.

Al-jon Incorporated: *See—*
Sharp, Allen B.; and Hull, Richard A., 3,885,292.

Albers, Edwin Wolf: *See—*
Pilato, Joseph Michael; Magee, John Storey, Jr.; and Albers, Edwin Wolf, 3,886,094.

Albert, William C., to Singer Company, The. Floated gyro with angular inertia compensation. 3,885,443, Cl. 74-5.00R.

Albright, James A.: *See—*
Dorschner, Kenneth P.; and Albright, James A., 3,885,953.
Dorschner, Kenneth P.; and Albright, James A., 3,885,954.

Albright, Patrick J.; and Roberts, Joseph P. Method of making jewelry and the like. 3,886,051, Cl. 204-18.00R.

Alburn, Harvey E.: *See—*
Dvonch, William; and Alburn, Harvey E., 3,886,186.

Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gun, Dmitry Rudolfovich; Kantor, Ilya Solomonovich; Kakhniashvili, Avtandil Semenovich; Topolyansky, Jury Arnoldovich; Suladze, Ippolit Davidovich; and Tsimbler, Jury Abramovich. Receiving-and-dispatching station. 3,885,757, Cl. 243-19.000.

Alexeff, Alexander V., to Alexeff-Snyder Enterprises, Inc. Fabric splice apparatus. 3,885,596, Cl. 139-28.000.

Alexeff-Snyder Enterprises, Inc.: *See—*
Alexeff, Alexander V., 3,885,596.

Alfs, Helmut: *See—*
List, Ferdinand; Alfs, Helmut; Wember, Kurt; and Orlowski, Friedrich-August, 3,886,200.

Allard, Lavale. Can top removal mechanism. 3,885,700, Cl. 220-263.000.

Altmann, Jack G. Method and temple apparatus for guiding fabric lengths through textile weaving machines. 3,885,600, Cl. 139-292.000.

Alton Box Board Company: *See—*
Wilkinson, Robert M.; and Lyon, James R., 3,886,019.

Altseimer, John H.; and Hanold, Robert J., to United States of America, Energy Research and Development Administration. Apparatus and method for large tunnel excavation in hard rock. 3,885,832, Cl. 299-14.000.

Aluminum Pechiney: *See—*
Bulit, Roger, 3,885,983.

Alvarez, Francisco S.; and Van Horn, Albert R., to Syntex (U.S.A.) Inc. Novel prostaglandin intermediates and process for the production thereof. 3,886,185, Cl. 260-345.900.

Amagami, Keizo; Takahashi, Yutaka; Nawa, Motoyuki; Kawabata, Norio; Nishibayashi, Nobuhiko; and Sasada, Katsumi, to Matsushita Electric Industrial Co., Ltd. Hot water controlling device. 3,885,736, Cl. 237-8.00R.

Amann, August: *See—*
Himmele, Walter; Amann, August; Aquila, Werner; Giertz, Hubert; and Siegel, Hardo, 3,886,168.

Amano, Hirota: *See—*
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AMAX Inc.: *See—*
Scarpino, Leopoldo, 3,886,409.

Amberg, Stephen W.; Doherty, Thomas E.; and Heyne, Clarence A., to Owens-Illinois, Inc. Article handling chuck. 3,885,825, Cl. 294-115.000.

American Bank Note Company: *See—*
Laxer, Herbert, 3,886,083.

American Can Company: *See—*
Kuchenbecker, Morris William; and Oppermann, Walter John, 3,885,341.

American Cyanamid Company: *See—*
Fetchin, John Allan; Marzluff, William Frank; and Barber, William Austin, 3,886,213.
Kemme, Herbert Rudolph Conrad; and Scharf, Edward Jonathan, 3,886,223.

Loffelman, Frank Fred, 3,886,078.
American Environmental Products Corp.: *See—*
Cerniglia, Vincent J., 3,885,466.
American Fine Foods, Inc.: *See—*
Solterbeck, Ward W., 3,885,375.
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Baker, Don R.; Teach, Eugene G.; and Arneklev, Duane R., to Stauffer Chemical Company. Meta-substituted ether anilides as algicidal agents. 3,885,948, Cl. 71-67.000.
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Bayer, Gerhard; Cherdron, Egon; Haerter, Manfred; and Hecht, Ernst, to Gebr. Giulini GmbH. Method for producing bricks from red mud. 3,886,245, Cl. 264-56.000.
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Bert, Alain; and Kantorowicz, Gerard, to Thomson-CSF. Device for storing high frequency signals. 3,886,503, Cl. 333-30.00R.

Bert, Alain; and Kantorowicz, Gerard, to Thomson-CSF. Piezoelectric delay line for storing high frequency signals. 3,886,527, Cl. 340-173.0CR.

Bert, Alain; and Kantorowicz, Gerard, to Thomson-CSF. Electroacoustic memory device. 3,886,529, Cl. 340-173.0CR.

Berthiez, Charles William. Bi-Rotational heads mounted on milling and boring machines. 3,885,280, Cl. 29-26.00R.

Berthon, Robert; and Bichara, Michel, to Mines de Potasse d'Alsace S.A. Electrostatic separation of potash ores. 3,885,673, Cl. 209-9.000.

Bertus, Brent J., to Phillips Petroleum Company. Nickel and cobalt catalysts including a group IIA and VIA component. 3,886,090, Cl. 252-432.000.

Bertus, Brent J., to Phillips Petroleum Company. Catalysts for oxidative dehydrogenation. 3,886,091, Cl. 252-432.000.

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Bibbens, William H. Sealing assembly. 3,885,799, Cl. 277-81.00P.

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Blatt, Leland F. Variable cushion shock absorber. 3,885,776, Cl. 267-34.000.

Block, Donald P. Control mechanism. 3,885,779, Cl. 251-229.000.

Blom, Sigvard E. Supporting stand preferably adapted for supporting a christmas tree. 3,885,763, Cl. 248-44.000.

Bloom, Stanley M.; and Hoffman, Arnold, to Polaroid Corporation. Galvanic cell. 3,885,990, Cl. 136-102.000.

Blucher, Joseph T.: *See—*
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Blumberg, Shmaryahu; Holmquist, Barton; and Vallee, Bert L. Acylation of proteolytic enzymes. 3,886,042, Cl. 195-62.000.

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Boehner, Beat; and Dawes, Dag, to Ciba-Geigy Corporation. Triazolyl carbamate insecticides. 3,886,280, Cl. 424-269.000.

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Boersma, Rintje; and Irik, Gijsbert Waldemar, to COQ B.V. Metal clad switch gear for high voltages. 3,886,336, Cl. 200-48.00R.

Boesel, Walter F., to Garrett Corporation, The. Methods of making dynamoelectric machinery. 3,885,302, Cl. 29-596.000.

Bohle, Lorenz. Method and apparatus for filling adjacent insulating tubes forming the positive plate of a lead-acid storage battery. 3,885,988, Cl. 136-27.000.

Bohrdt, Joaquin: *See—*
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Bolduc, Germain C. Vehicle suspension device. 3,885,775, Cl. 267-11.000.

Bolger, Justin C., to Amicon Corporation. Polyurethane composition curable with polyamine/acid anhydride adduct. 3,886,228, Cl. 260-858.000.

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Borg, Sven Christer; Hesson, Christer Ragnar; and Nilsson, Erik Henning, to Aktiebolaget Electrolux. Material handling apparatus. 3,885,678, Cl. 214-1.0BB.

Borg-Warner Corporation: *See—*
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Borman, Willem F. H.; and Reilly, Eugene P., to General Electric Company. Stabilized polyester compositions. 3,886,104, Cl. 260-22.0EP.

Bornand, Robert M., to Valinor Anstalt. Percussion igniter for projectiles and projectile embodying the same. 3,885,500, Cl. 102-45.000.

Bornfleth, Ulrich; Selonke, Fritz; and Scharnetzke, Horst, to Hauni-Werke Korber & Co. KG. Apparatus for temporary storage and transport of cigarettes or the like. 3,885,683, Cl. 214-17.0CA.

Borst, Gaylord M.; and Meyer, Martin H., to Outboard Marine Corporation. Power trim-tilt system. 3,885,517, Cl. 115-41.0HT.

Borthwick, James; and Morman, James Forrester, to Imperial Chemical Industries Limited. Smoking mixture. 3,885,574, Cl. 131-2.000.

Bosch, Paul, to Robert Bosch G.m.b.H. Radial piston machine. 3,885,457, Cl. 91-488.000.

Bossaert, Jean; Ernvein, Joel; and Spitz, Erich, to Thomson-CSF. System for the real time visualization of ultrasonic images. 3,886,488, Cl. 340-5.0MP.

Bottenberg, Hans, to Siemens Aktiengesellschaft. Radar device with a directional antenna. 3,886,547, Cl. 343-100.0SA.

Bouman, Antonius Fredericus Mattias, to Hollandse Signaalapparaten B.V. Voltage-regulated power supply unit. 3,886,438, Cl. 323-22.00T.

Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Device for installing and removing big-end caps of connecting rods on internal combustion engines. 3,885,290, Cl. 29-252.000.

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Bowser, George H.; Mazzoni, Renato J.; and Martinec, John P., to PPG Industries, Inc. Pivoted arm device for assembly of multiple glazed units. 3,886,013, Cl. 156-109.000.

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Bratter, Robert L.; and Gaind, Arun K., to International Business Machines Corporation. Method for controlling dielectric isolation of a semiconductor device. 3,886,000, Cl. 148-175.000.

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Breckenfelder, Ernst G., to U.I.P. Engineered Products Corporation. Process for making non-felt, laminar roofing material such as composition shingles and the like. 3,886,021, Cl. 156-246.000.

Bredeweg, Roger L., to Dow Chemical Company, The. Cell useful for determining water vapor transmission rate or water content. 3,886,057, Cl. 204-195.00W.

Breeden, John F., to Hopeman Brothers, Inc. Waste disposal system. 3,885,835, Cl. 302-39.000.

Breitweg, Peter; Franz, Karl-Heinz; Mayer, Peter; and Wolf, Klaus, to Roland Offsetmaschinenfabrik Faber & Schleicher. Device for applying ink to the inking roller of an offset printing press. 3,885,496, Cl. 101-363.000.

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Breslow, Jeffrey D., to Marvin Glass & Associates. Game apparatus. 3,885,792, Cl. 273-134.00C.

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Bridgestone Tire Company Limited: *See*—
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British Secretary of State for Defense: *See*—
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Brouneus, Harold A., to Corning Glass Works. Electrical connection and method of making same. 3,885,848, Cl. 339-17.00C.

Brown, Edward A., to G. D. Searle & Co. 17-Hydroxy-3-oxo-17α-pregna-4,7-diene-21-carboxylic acid-lactone, 4′,5′-dihydrospiro[androsta-4,7-diene-17,2′(3′H)-furan]-3-one, and intermediates thereto. 3,886,146, Cl. 260-239.55R.

Brown, Larry P., to Cities Service Oil Company. Process for carbon dioxide manufacture. 3,885,624, Cl. 166-57.000.

Brown, Melancthon S., deceased; and by Kohn, Gustave K., administrator, to Chevron Research Company. Nematocidal N-arylthio S-hydrocarbyl thiocarbamates. 3,886,282, Cl. 424-300.000.

Brown, Paul J.; and Smith, Ronald M., to International Business Machines Corporation. Shared data controlled by a plurality of users. 3,886,525, Cl. 340-172.500.

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Brugh, Latane D., Jr.; and Smith, John W., Jr., to Westvaco Corporation. Fiberboard carton product and method of manufacture. 3,886,017, Cl. 156-184.000.

Bubb, Max, to Designa GmbH. Display device. 3,885,337, Cl. 40-152.100.

Bucher, John H.; and Jancula, Daniel F., to Jones & Laughlin Steel Corporation. Method of producing a hot rolled and age hardened columbium-bearing steel product. 3,885,997, Cl. 148-12.300.

Buckley, William D., to Energy Conversion Devices, Inc. Filament-type memory semiconductor device and method of making the same. 3,886,577, Cl. 357-2.000.

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Burke, Oliver W., Jr. Detergent compositions and detergent adjuvant combinations thereof, and processes for forming the same. 3,886,079, Cl. 252-109.000.

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Burns, Richard H.; Button, Roger E.; Martens, Alexander E.; and Morton, Roger R., to Bausch & Lomb Incorporated. Calibration of particle velocity measuring instrument. 3,885,415, Cl. 73-1.00D.

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Byrne, Neil C.; Cullen, John R.; Parker, Richard G.; and Davis, Harry L., to International Standard Electric Corporation. Beehive frame. 3,885,260, Cl. 6-2.00R.

Cain, Robert G., to International Business Machines Corporation. Balanced superconductive transmission line using Josephson tunnelling devices. 3,886,382, Cl. 307-245.000.

Cairns, John Francis; and Case, John Reginald, to Imperial Chemical Industries Limited. Manufacture of bipyridylium salts. 3,886,172, Cl. 260-296.00D.

Caldwell, Hamlin A., Jr.; and Miller, Ralph R., III, to United States of America, Navy. Rigid line array suspension system. 3,885,515, Cl. 114-235.00B.

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Cameron, Frank L.; and Iandola, Robert C., to Westinghouse Electric Corporation. Spring and shunt assembly for circuit interrupter. 3,886,512, Cl. 337-178.000.

Cami, Charles N. Mazal. Catheter. 3,885,561, Cl. 128-214.000.

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Campbell, Robert J. Means for and method of purifying contaminated water. 3,885,399, Cl. 62-123.000.

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Casagrande, Cesare; and Canonica, Luigi, to Siphar S.A. Method for the synthesis of (±)-glaziovine. 3,886,166, Cl. 260-289.00R.

Cascio, Salvatore J., to International Business Machines Corporation. Method and device for detecting presence or absence of a fluid. 3,885,435, Cl. 73-290.00R.

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Centre National Pour L'Exploitation Des Oceans: *See—*
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Chanlon, Gerard, to Creusot-Loire. Barrel mechanism for a piston pump. 3,885,444, Cl. 74-60.000.

Charransol, Pierre; Hauri, Jacques; and Fontana, Serge Robert, to International Standard Electric Corporation. Process and apparatus for switching PCM signals from a normal transmission path to an emergency path. 3,886,318, Cl. 179-15.0BF.

Charron, William W.; Dickensheets, William E.; Harrison, Robert S.; and Nowroski, Alvin P., to Ford Motor Company. Carburetor cold enrichment device. 3,885,545, Cl. 123-180.00R.

Chase, George Oswald, to Hoffmann-La Roche Inc. Preparation of 5-pyridyl benzodiazepine utilizing hexamethylenetetramine. 3,886,141, Cl. 260-239.30D.

Chase, Vance A., to Whittaker Corporation. Thick-walled, fiber-reinforced composite structures and method of making same. 3,886,024, Cl. 156-294.000.

Chaundy, Gerald J.; Ezis, Andre; Goodyear, Michael U.; Howes, Benjamin T.; Johnson, Carl F.; and Styhr, Karsten H., to Ford Motor Company. Method of making a bonded silicon nitride article having portions of different density. 3,885,294, Cl. 29-420.000.

Cheal, James; and McHenry, Vincent J., to Omni Spectra, Inc. Intrusion detection system. 3,886,549, Cl. 343-7.700.

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Chen, Carl; and Ganci, James Barry, to du Pont de Nemours, E. I., and Company. Tannin treatment for non-porous semipermeable membranes. 3,886,066, Cl. 210-23.000.

Chen, Chieh Yang, to American Optical Corporation. Quick discharge circuit for pacer nuclear power supply. 3,885,572, Cl. 128-419.00P.

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Chiba, Iwane; Mori, Toshihiro; and Yamazaki, Noboru, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for electromagnetic detection of welds in metal strips including pressing means for the strip. 3,886,445, Cl. 324-37.000.

Chibata, Ichiro; Tosa, Tetsuya; Sato, Tadashi; and Yamamoto, Kozo, to Tanabe Seiyaku Co., Ltd. Novel Process for preparing L-citrulline. 3,886,040, Cl. 195-29.000.

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Chika, John J. Seat supporting structure for fast moving vehicles. 3,885,810, Cl. 280-150.00B.

Chiku, Takewo; Yamamoto, Shin; and Huruhashi, Mikio, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Battery state-of-charge indicator. 3,886,442, Cl. 324-29.500.

Childers, John S.; and Mandrell, Clayton C., to Reed Tool Company. Drill bit bearings. 3,885,838, Cl. 308-8.200.

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Christensen, Bruce A., to Sperry Rand Corporation. Checking circuit for a 1-out-of-n decoder. 3,886,520, Cl. 340-146.1AB.

Christensen, Don Edward: *See—*
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Christensson, Od W., to Christenssons Maskiner & Patenter Aktiebolag. Sterilizable package. 3,885,730, Cl. 229-43.000.

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Christian, Anthony J. Ice skating vehicle. 3,885,803, Cl. 280-8.000.

Christian, Fredrick W. Trailer hitch. 3,885,817, Cl. 280-491.00E.
Chromecek, Richard C., to Airwick Industries, Inc. Polymer Complexes. 3,886,125, Cl. 260-78.3UA.
Chrysler Corporation: *See—*
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Chu, David C.; and Gliever, John H., to Hewlett-Packard Company. Random phase modulating time base and method to improve measurement averaging counter resolution. 3,886,451, Cl. 324-186.000.
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Claeson, Karl Goran; Karlsson, Birgitta Gunilla; and Svendsen, Lars-Gundro, to AB Bofors. New substrates for diagnostic use, with high susceptibility to trypsin and other proteolytic enzymes of the type peptide peptidohydrolases. 3,886,136, Cl. 260-112.500.
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Clippard, William L., III, to Clippard Instrument Laboratory, Inc. Method of manufacturing valves. 3,885,284, Cl. 29-157.10R.
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Cohen, Albert; Burckhalter, Frank O.; and Luongo, Michael C., to Westinghouse Electric Corporation. Automatic load and vacuum sensitive exhaust hood spray system. 3,885,822, Cl. 290-1.00R.
Cohen, Maxwell L., to Cohen, Milton. Mixing dispenser with a selectively retractable seal to permit intermixing of the ingredients. 3,885,710, Cl. 222-145.000.
Cohen, Milton: *See—*
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Cohen, Mitchell S., Jr.: *See—*
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Colardelle, Joel Serge; Girard, Pierre; and Lerouge, Claude Paul Henri, to International Standard Electric Corporation. Full electronic two-wire to four-wire conversion circuit. 3,886,322, Cl. 179-170.0NC.
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Continental Can Company of Canada Limited: *See—*
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Cook, Melvin A., to Ireco Chemicals. Blasting composition for use under high temperature conditions. 3,886,008, Cl. 149-41.000.
Cooper, Paul G., to Harrop Precision Furnace. Dilatometer apparatus. 3,885,416, Cl. 73-16.000.
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Brouneus, Harold A., 3,885,848.
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Cosgrove, John H., to FMC Corporation. Process of obtaining zinc oxide having improved filtering characteristics and production of zinc sulfate from said zinc oxide. 3,886,258, Cl. 423-106.000.
Costa, Robert B.; and Troup, Edward M., to Clemar Manufacturing Corporation. Camming system including a flexible cam of adjustable peripheral length. 3,885,470, Cl. 74-568.00R.
Costello, Anthony C.; Shaffer, Leon L.; and Weatherby, Robert G., to Loopco Industries, Inc. Take-out arbor for a strip accumulator. 3,885,748, Cl. 242-55.000.
Costello, Matthew J.; Dolan, Donald T.; Debaudringhien, Andre T.; Hurkmans, Antoon M.; Jasinski, Kenneth R.; and Keplinger, Edward G., to Graphic Sciences, Inc. Facsimile receiver. 3,886,308, Cl. 178-7.300.
Cota, Marlo E.; and Osborne, John F., to Motorola, Inc. Method of manufacturing semiconductor devices. 3,886,005, Cl. 148-188.000.
Cottatellucci, Ezio, to Societa Italiana Telecomunicazioni Siemens S.p.A. System for stabilizing the operating frequency of a free-running oscillator. 3,886,472, Cl. 331-12.000.
Cottin, Jean; and Laxaque, Jean, to Thomson-CSF. Automatic vehicle-monitoring system. 3,886,515, Cl. 340-23.000.
Cousino, Bernard A., to Cousino Corporation. Storage cell assembly. 3,885,670, Cl. 206-387.000.
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Cox, Joe Warren. Self-adjusting stair. 3,885,365, Cl. 52-183.000.

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Crabbe, Pierre; and Vogel, Pierre, to Syntex (U.S.A.) Inc. 10,11-Methylene-substituted phostaglandin derivatives. 3,886,206, Cl. 260-514.00D.

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Crisp, Chester A.; and Williamson, Herschel M., to Caterpillar Tractor Co. Self-locking piston and rod assembly for a fluid motor or the like. 3,885,461, Cl. 92-258.000.

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Cronin, John C.; and Cron, James C., to I-T-E Imperial Corporation. Plug-in joint for high current conductors in gas-insulated transmission system. 3,886,301, Cl. 174-21.00C.

Cross, Fred E., Jr., to Highway Equipment & Supply Company. Fluid propelling apparatus employing flexible drive shaft. 3,885,885, Cl. 415-122.000.

Croswell, Thomas L., Jr., to Croswell, Thomas L., Jr. Airplane wing camber control. 3,885,758, Cl. 244-44.000.

Crull, Stanley W., to Sundstrand Corporation. Control for a hydrostatic transmission. 3,885,388, Cl. 60-444.000.

Cubic Industrial Corporation: *See—*
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Cuda, John: *See—*
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Cudmore, Patrick J., to Wane-Rider, Incorporated. Roller skate. 3,885,804, Cl. 280-11.200.

Cue, Berkeley Wendell, Jr.: *See—*
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Culver, Richard B., to Dresser Industries, Inc. Method and apparatus for logging well boreholes with gamma rays from the inelastic scattering of fast neutrons. 3,886,355, Cl. 250-270.000.

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Cummings, Thomas R.; and Hewitt, William J., to Singer Company, The. Method and apparatus for simulating a class of aircraft. 3,886,334, Cl. 235-184.000.

Cunningham, Roy J.; and Lieberman, Warren, to Boeing Company, The. Process for carburizing high alloy steels. 3,885,995, Cl. 148-6.350.

Curti, Lucien. Coupling for the assembly of closely jointed tubular elements. 3,885,882, Cl. 403-297.000.

Curtis, Gary Martin, to Illinois Tool Works Inc. Locking staple. 3,885,491, Cl. 85-49.000.

Cushing, Donald S., to General Electric Company. Dishwasher control system. 3,885,580, Cl. 134-57.00D.

Cutler-Hammer, Inc.: *See—*
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D. G. Beyer, Inc.: *See—*
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Dacons, Joseph C.; Adolph, Horst G.; and Kamlet, Mortimer J., to United States of America, Navy. Substituted hexanitrobiphenyls. 3,886,173, Cl. 260-296.00R.

Daggett, Lester Alvin, to Eagle-Picher Industries, Inc. Battery switching circuit. 3,886,426, Cl. 320-7.000.

Dahan, Gilbert Mordekhai Ihouda; Schrempp, Jean; and Viannay, Stephane Georges Jean-Marie, to Usinor. Machine for cooling metal sheets or plates. 3,885,581, Cl. 134-122.000.

Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, to Astra Lakemedel Aktiebolag. Iron preparation suitable for parenteral injection and a process for the preparation thereof. 3,886,267, Cl. 424-78.000.

Dahlin, Erik B., to Measurex Corporation. Method of controlling a drier limited paper machine. 3,886,036, Cl. 162-198.000.

Dahm, Victor, to Beratherm AG. Method for the chemical treatment, like cleaning or pickling, of installations with at least one steam generator. 3,885,986, Cl. 134-3.000.

Daikin Kogyo Co. Ltd.: *See—*
Koizumi, Shun; Suzuki, Takeshi; and Okuno, Chuzo, 3,886,103.

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Lamm, Heinz; and Kortner, Lothar, 3,885,898.

D'Alelio, Gaetano F., to University of Notre Dame du Lac. Epoxy end-capped aromatic polyimides. 3,886,119, Cl. 260-47.0CP.

D'Alelio, Gaetano F. Halogenated esters of phosphorus-containing acids. 3,886,236, Cl. 260-952.000.

D'Alelio, Gaetano F. Halogenated phosphonates. 3,886,237, Cl. 260-956.000.

Dalferth, Hans Horst. Overload testing of chains. 3,885,428, Cl. 73-143.000.

Dalgleish, Jack Frank; and Lukas, Helmut Hans, to Northern Electric Company Limited. Optical fibre connectors. 3,885,859, Cl. 350-96.00C.

Dalke, James A., to Metro Data Corporation. Chroma generator for character display. 3,886,588, Cl. 358-82.000.

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Danko, Edward M., to Color Custom Compounding, Inc. Method and apparatus for making an extruded article of rigid plastic with a grained surface. 3,886,250, Cl. 264-177.00R.

Darnell, Nolan B.; and Engels, Walter, to Deering Milliken Research Corporation. Yarn feed guide arms. 3,885,279, Cl. 28-1.0CL.

Datotek, Inc.: *See—*
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Daugherty, Jon: *See—*
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Davenport, Alvan F.; Gerken, Ralph F.; and Wiens, Jacob H. Method and device for teaching safe driving. 3,885,324, Cl. 35-11.000.

Davidson, Daniel Fraser, to United Kingdom Atomic Energy Authority. Electromagnetic pumps. 3,885,890, Cl. 417-50.000.

Davidson, Jimmy L.: *See—*
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Davy, Thomas E.; and Marquess, Gerald E., to Nichols Engineering & Research Corporation. Incinerator systems. 3,885,507, Cl. 110-8.00R.

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Dawkins, Claude W. Air conditioning system for a motor home vehicle or the like. 3,885,398, Cl. 62-89.000.

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De Brabander, Jean L., to Ferdinand Van Damme & Zonen. Working glove. 3,885,249, Cl. 2-161.00R.

de Carbon, Christian Bourcier. Level corrector for shock absorbers. 3,885,777, Cl. 267-64.00R.

De Christopher, Philip J.: *See—*
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Deisenroth, Robert J., to Excel Industries, Incorporated. Closure counterbalance. 3,885,778, Cl. 267-71.000.

DeJong, Geert J., to Akzo N.V. Process for the preparation of a granular activated carbon, and granular activated carbons produced thereby. 3,886,088, Cl. 252-422.000.

De Lavenne, Hubert, to Automobiles Peugeot Regie Nationale des Usines Renault. Locking device in particular for a safety belt. 3,885,812, Cl. 280-150.05B.

Delerue, Dominique Michel. Hank carrier. 3,885,754, Cl. 242-127.000.

Deluty, Michael E.; and Levine, Morton A., to Deluty, Michael E. Exercising device. 3,885,789, Cl. 272-83.00A.

Demag A.G.: *See—*
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Demetron Gesellschaft fur Elektronik Werkstoffe mbH: *See—*
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Yagi, Norio; Okai, Hiroshi; Fukuda, Makoto; and Kishi, Ikuji, 3,886,121.

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Denzin, Horst, to Francotyp GmbH. Device for feeding adhesive strips to a franking machine. 3,885,482, Cl. 83-241.000.

De Pasquale, Matthew J.: *See—*
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Deplante, Henri, to Avions Marcel Dassault-Breguet Aviation, Societe Anonyme Francaise ayant son siege Social. Structural panels of the sandwich type. 3,886,023, Cl. 156-253.000.

Derrwaldt, Philip A., to D. G. Beyer, Inc. Detachable auxiliary load distributing assembly. 3,885,808, Cl. 280-81.00R.

Desautels, Paul M.; and Remsen, Lawrence P., to International Business Machines Corporation. Polyphase arc stripper. 3,886,343, Cl. 219-68.000.

Deschler, Otto: *See—*
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De Schutter, Camiel R., to Perfect Module Systems, Inc. Building wall panel leveler device. 3,885,361, Cl. 52-122.000.

Designa GmbH: *See—*
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Desimone, Robert S.; and Gradeff, Peter S., to Rhodia, Inc. Process using metal salt-amine complex catalysts for the preparation of alpha beta-ethylenic ketones such as delta-cis-pseudo ionones. 3,886,215, Cl. 260-586.00C.

DeSimone, Robert S.; and Gradeff, Peter S., to Rhodia, Inc. Process for the preparation of alfa beta-ethylenic ketones. 3,886,216, Cl. 260-593.00R.

Desimone, Robert S.; and Gradeff, Peter S., to Rhodia, Inc. Process for the preparation of alpha, beta-ethylenic ketones such as delta^2-cis-pseudo ionones. 3,886,217, Cl. 260-593.00R.

Desjardins, Rene A., to Boeing Company, The. Flexure for bearingless rotor. 3,885,887, Cl. 416-141.000.

Deutner, Wolfgang; and Neumann, Robert, to Chemie Linz AG. Process for the preparation of pure phthalic anhydride. 3,886,050, Cl. 203-80.000.

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Dewald, Horace A.: *See—*
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Dezelan, Joseph E.; Junck, John A.; and Kroth, Neil W., to Caterpillar Tractor Co. Filter retainer and bypass valve assembly. 3,886,072, Cl. 210-130.000.

Diamanti, Enrico, to Sigma-Tau Industrie Farmaceutiche/Riunite S.p.A. New derivative of triamcinolone. 3,886,145, Cl. 260-239.55D.

Dias, J. Fleming; and Karrer, Henry E., to Hewlett-Packard Company. Acoustic surface wave devices having improved performance versus temperature characteristics. 3,886,484, Cl. 331-107.00A.

Dibbern, John Earl, Jr.: *See—*
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DiChiara, Anthony J. Method of rebuilding a worn cam surface. 3,885,291, Cl. 29-401.000.

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Diehl, Arne J.: *See—*
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Diehl, Roy E., to Ford Motor Company. Road load modulated exhaust gas recirculation system. 3,885,537, Cl. 123-119.00A.

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Diichi Seiyaku Company, Limited: *See—*
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Dill, Gary G. Multi-filament light bulb and the like. 3,886,400, Cl. 315-64.000.

Dimitri, Mitchell S., to Westvaco Corporation. Activated carbon with active metal sites and process for producing same. 3,886,093, Cl. 252-447.000.

Dingwall, Andrew Francis Gordon, to RCA Corporation. Self-biased complementary transistor amplifier. 3,886,464, Cl. 330-13.000.

Dini, Mamiliano, to European Rotogravure Association. Method for the examination or inspection of rotogravure printing cylinders or the like. 3,885,422, Cl. 73-67.80S.

DiSalvo, Walter A.; Kenney, Edward J.; and Smith, Frank R., Jr., to Colgate-Palmolive Company. Manufacture of free flowing particulate detergent composition containing nonionic detergent. 3,886,098, Cl. 252-540.000.

Diskus, Alfred; Schonbeck, Rupert; Kloimstein, Engelbert; and Mayr, Hubert, to Osterreichische Stickstoffwerke. 3-Phenyl-4;5-dichloro pyridazinyl alkanoates. 3,886,155, Cl. 260-250.00A.

Dobkin, Robert C., to National Semiconductor Corporation. Method of fabricating a vertical channel FET resistor. 3,886,001, Cl. 148-175.000.

Dobosi, Laszlo J. Credit card. 3,886,327, Cl. 235-61.70B.

Dobras, Bruce W., to Monarch Marking Systems, Incorporated. Coded record and methods of and apparatus for encoding and decoding records. 3,886,521, Cl. 340-146.1AG.

Doepke, Donald G. H.; and Braun, Daniel E., to Briggs & Stratton Corporation. Refueling and ignition grounding device for small engines equipped with a protective hood. 3,885,547, Cl. 123-198.00D.

Doherty, Thomas E.: *See—*
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Dorr, Richard L.; Gaebelein, Georg N.; Kostuch, Donald J.; and Varner, Malcolm E., to International Business Machines Corporation. Formatting for record-controlled machines. 3,886,325, Cl. 235-61.60R.

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Dorschner, Kenneth P.; and Albright, James A., to SCM Corporation. Meta-3-alkoxyureidophenyl N-haloalkyl carbamates as herbicides. 3,885,954, Cl. 71-106.000.

Dory, Istvan; Feuer, Laszlo; Javor, Andras; and Matolcsy, Gyorgy, to Chinoin Gyogyszer- es Vegyeszeti Termekek Gyara Rt. Fungicidal carboxylic acid nitriles. 3,886,283, Cl. 424-304.000.

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Dvonch, William; and Alburn, Harvey E., to American Home Products Corporation. Mononitrate esters of 1,4:3,6-dianhydro-d-glucitol. 3,886,186, Cl. 260-347.200.

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Economou, George J. Process for the reduction of pain in the removal of adhesive tapes and bandages. 3,885,559, Cl. 128-156.000.

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Egermayer, George W. Sign holding and framing assembly. 3,885,335, Cl. 40-125.00G.

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Forgo, Gabor; Meyer, Erwin; and Moser, Karl, to Zellweger Uster AG. Electrostatic printer with movable style. 3,886,563, Cl. 346-74.0ES.

Forrest, John W., to Bowman/Ali, Inc. Switch operating device for use with an over center diaphragm switch contact assembly with contact ramp camming surface. 3,886,341, Cl. 200-328.000.

Forsberg, John R.: *See—*
Edelberg, Norman L.; and Forsberg, John R., 3,885,577.

Forslund, Erik Torsten; and Morenius, Bo Emil Fredrik, to Ostbergs Fabriks AG. Tree harvesting device for hydraulic operation. 3,885,610, Cl. 144-34.00R.

Forster, Eckehard: *See—*
Richter, Helmut; Forster, Eckehard; Spetzler, Edgar; Wendorff, Jochen; and Rommerswinkel, Heinrich-Wilhelm, 3,885,957.

Forster, Hans-Joachim M.; and Bulow, Manfred, to Daimler-Benz Aktiengesellschaft. Servo-steering device for vehicles. 3,885,456, Cl. 91-380.000.

Foster, Jack D.; Kirk, Russell F.; Moreno, Frederick E.; and Ahmed, Samir A., to GTE Sylvania Incorporated. Power stabilized CO_2 gas transport laser. 3,886,481, Cl. 331-94.50T.

Foster, Thomas W., to Fiberboard Corporation. Carton with easy opening reclosure. 3,885,732, Cl. 229-51.0TC.

Fouineteau, Gilberte. Domestic appliance for drying vegetables. 3,885,321, Cl. 34-58.000.

Foye, John J., to Kaiser Aluminum & Chemical Corporation. DC casting mold assembly. 3,885,617, Cl. 164-283.000.

Fraioli, Donato M., to Air-Tech Industries Inc. Reinforces inflatable. 3,885,360, Cl. 52-2.000.

Francotyp GmbH: *See—*
Denzin, Horst, 3,885,482.

Frantzreb, John G., Sr.; and Hansen, Robert C., to Caterpillar Tractor Co. Welding fume extractor. 3,886,344, Cl. 219-130.000.

Franz, Karl-Heinz: *See—*
Breitweg, Peter; Franz, Karl-Heinz; Mayer, Peter; and Wolf, Klaus, 3,885,496.

Fred Whitaker Company: *See—*
Whitaker, Ralph, 3,885,278.

Freenor, Francis J., III, to Chevron Research Company. S,S-dialkyl-N-substituted phosphoroamidodithionites. 3,886,238, Cl. 260-959.000.

Freese, Lennart Werner, to New-Invent S.A. Telescopic piston-cylinder assembly for hydraulic machines and machinery components. 3,885,459, Cl. 92-119.000.

Frei, Oskar; and Mukherjee, Dilip. Cooled rotor blade for a gas turbine. 3,885,609, Cl. 416-97.000.

Freiberg, Robert J.: *See—*
Haas, Roger A.; Chenausky, Peter P.; and Freiberg, Robert J., 3,885,874.

French, Charles S., to Scott USA. Ski boot with cantable upper. 3,885,329, Cl. 36-2.5AL.

French, John B., to Compac Corporation. Label applicator with retention means for flexible air tubes. 3,885,705, Cl. 221-211.000.

Fridlund, Karl Gosta; and Jiveman, Jan Urban, to Gosta Fridlund. Office folder. 3,885,726, Cl. 229-1.50R.

Fried, John H.: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,886,162.
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,886,181.

Friedrich Schmaltz GmbH: *See—*
Marowsky, Kurt, 3,885,924.

Friendship, Kenneth F. M., to Continental Can Company, Inc. Process for heat treating plastic bottles. 3,886,253, Cl. 264-238.000.

Friesen, Dietrich P. Method of and apparatus for projecting spliced film or tape. 3,885,864, Cl. 352-204.000.

Friesz, Reinhardt. Wet concrete separator. 3,886,063, Cl. 209-44.000.

Fritz Schwarzer GmbH: *See—*
Atzinger, Wolfgang; and Reetz, Heinz, deceased, 3,886,562.

Froberg, Magnus Laird: *See—*
Rees, Vernon Chester, deceased; and Froberg, Magnus Laird, 3,885,945.

Fronk, Stanislav Vladislavovich: *See—*
Akimov, Jury Stepanovich; Galaev, Auli Alexandrovich; Gorelik, Semen Samuilovich; Gofman, Boris Izrailevich; Ermoshin, Vyacheslav Dmitrievich; Korovin, Stanislav Konstaninovich; Naumov, Vladimir Vasilievich; Preobrazhentsev, Konstantin Andreevich; Fronk, Stanislav Vladislavovich; Shvartsman, Vadim Lvovich; Garshenin, Vladimir Vasilievich; Stakhov, Oleg Fedorovich; Kruglov, Igor Ivanovich; and Samokhvalov, Mark Markovich, 3,886,002.

Frump, John A., to Commercial Solvents Corporation. Oxazoline emulsifier in polymerization of styrene and butadiene. 3,886,128, Cl. 260-84.700.

Frye, Bruce J. Separable self-securing holding device. 3,885,768, Cl. 248-467.000.

Fuji Electric Co., Ltd.: *See—*
Niwa, Koichi, 3,886,417.

Fuji Photo Film Co., Ltd.: *See—*
Asano, Yoshio; and Ohkubo, Kinji, 3,886,570.
Ikenoue, Shinpei; and Masuda, Takao, 3,885,968.
Kato, Hisatoyo, 3,885,971.
Kiritani, Masataka; Matsukawa, Hiroharu; Watanabe, Akio; and Imamiya, Hitoshi, 3,886,085.
Miyahara, Junji, 3,885,970.
Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; and Shishido, Tadao, 3,885,967.

Fujidai Rubber Industry Company, Ltd.: *See—*
Hirasawa, Yaichiro, 3,885,328.

Fujieda, Hiroshi; and Yamamoto, Taro, to Matsushita Electric Industrial Co., Ltd. Ultrasonic generator and burner. 3,885,902, Cl. 431-1.000.

Fujii, Akio: *See—*
Umezawa, Hamao; Takita, Tomohisa; Fujii, Akio; and Fukuoka, Takeyo, 3,886,133.

Fujii, Joanne G., to Beatrice Foods Company. Method for preparing bland caseinates. 3,886,300, Cl. 426-656.000.

Fujikawa, Akira; and Takusagawa, Takashi, to Bridgestone Tire Company Limited. Safety tire. 3,885,614, Cl. 152-340.000.

Fujimori, Masao, to Taiheiyo Coal Mining Co., Ltd. Mining shield-supporter. 3,885,397, Cl. 61-45.00R.

Fujimura, Akira, to Nippon Electric Company, Limited. Transport-direction reversing apparatus for an automatic mail handling system and the like. 3,885,664, Cl. 198-21.000.

Fujinami, Hiroshi: *See—*
Wakamatsu, Hisato; Fujinami, Hiroshi; and Kamiya, Toshihiro, 3,885,472.

Fujioka, Yoshisato; and Ishizuka, Tetsuro, to Kabushiki Kaisha Yashica. Zoom lens. 3,885,862, Cl. 350-186.000.

Fujishiken Ltd.: *See—*
Kikuchi, Zenichi; Yamada, Keijyo; and Kimura, Tatuo, 3,885,313.

Fujita, Hiroshi: *See—*
Katsumura, Hiroshi; Fujita, Hiroshi; and Kaneda, Kei, 3,886,581.

Fujita, Kiyoshi: *See—*
Uemura, Osamu; Fujita, Kiyoshi; and Onoda, Takeshi, 3,886,243.

Fujitsu Limited: *See—*
Owaki, Kenichi; Umeda, Shozo; Furuta, Hiroshi; Hirose, Tadatsugu; and Shimuzi, Michihiro, 3,886,403.
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Takagi, Mikio; Kamioka, Hajime; Nakayama, Kazufumi; and Terada, Chiaki, 3,886,003.

Fukuda, Kiyo: *See—*
Asai, Kiyotsugu; Kawabata, Toshihiko; Sakai, Koichi; Fukuda, Kiyo; Nagahisa, Seiji; and Ichikawa, Toshiyuki, 3,886,226.

Fukuda, Makoto: *See—*
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Yagi, Norio; Okai, Hiroshi; Fukuda, Makoto; and Kishi, Ikuji, 3,886,121.

Fukuoka, Takeyo: *See—*
Umezawa, Hamao; Takita, Tomohisa; Fujii, Akio; and Fukuoka, Takeyo, 3,886,133.

Funahashi, Takaji. Stamping device. 3,885,495, Cl. 101-327.000.

Funtikov, Evgeny Vasilievich: *See—*
Veprintsev, Vladimir Ivanovich; Klyachko, Lev Iosifovich; Kudrya, Nikolai Andreevich; Suslov, Evgeny Ivanovich; Grishin, Gennady Petrovich; Kolchin, Anatoly Vasilievich; Funtikov, Evgeny Vasilievich; Shpak, Vladimir Fedorovich; and Barkov, Vasily Andreevich, 3,885,637.

Furlenmeier, Andre; Lanz, Paul; Vogler, Karl; and Zanetti, Guido, to Hoffmann-La Roche Inc. 6-Acyl derivatives of aminopenicillanic acid. 3,886,142, Cl. 260-239.100.

Furth, Harold P.; and Ellis, Robert A., Jr., to United States of America, Energy Research and Development Administration. Magnetic pumping in spatially inhomogeneous magnetic fields. 3,886,402, Cl. 315-111.700.

Furukawa Electric Co., Ltd., The: *See—*
Sekiguchi, Hideo; and Sadamitsu, Kazuo, 3,886,251.

Furukawa, Junji; Kobayashi, Eiichi; and Kawagoe, Takahiro, to Bridgestone Tire Company Limited. Alkali metalated acetylene-conjugated diene random copolymer. 3,886,127, Cl. 260-82.100.

Furuta, Hiroshi: *See—*
Owaki, Kenichi; Umeda, Shozo; Furuta, Hiroshi; Hirose, Tadatsugu; and Shimuzi, Michihiro, 3,886,403.

Furutsu, Takashi, to Koyo Seiko Company Limited. Bearing lubricating device. 3,885,842, Cl. 308-187.000.

Fusaroli, Marzio; and Pecorella, Alessandro, to Ates Componenti Elettonici S.p.A. Planar epitaxial process for making linear integrated circuits. 3,885,999, Cl. 148-175.000.

G. D. Searle & Co.: *See—*
Brown, Edward A., 3,886,146.
Tweit, Robert C., 3,886,160.

G. J. Roush: *See—*
Fergason, James L., 3,885,982.

G & L Industries, Inc.: *See—*
Gordin, Myron K., 3,885,308.

G. Siempelkamp & Co.: *See—*
Reiners, Wolfgang, 3,885,901.

Gaebelein, Georg N.: *See—*
Dorr, Richard L.; Gaebelein, Georg N.; Kostuch, Donald J.; and Varner, Malcolm E., 3,886,325.

Gagnon, Victor J., to American Shoe Machinery Corp. Shoe support for lasting machine. 3,885,263, Cl. 12-142.00R.

Gaind, Arun K.: *See—*
Bratter, Robert L.; and Gaind, Arun K., 3,886,000.

Galaev, Auli Alexandrovich: *See—*
Akimov, Jury Stepanovich; Galaev, Auli Alexandrovich; Gorelik, Semen Samuilovich; Gofman, Boris Izrailevich; Ermoshin, Vyacheslav Dmitrievich; Korovin, Stanislav Konstaninovich; Naumov, Vladimir Vasilievich; Preobrazhentsev, Konstantin Andreevich; Fronk, Stanislav Vladislavovich; Shvartsman, Vadim Lvovich; Garshenin, Vladimir Vasilievich; Stakhov, Oleg Fedorovich; Kruglov, Igor Ivanovich; and Samokhvalov, Mark Markovich, 3,886,002.

Galatha, Matthew J.; and Tynan, Richard F., to International Business Machines Corporation. Document photography system. 3,885,871, Cl. 355-23.000.

Gale, Walter W.; Ashcraft, Thomas L., Jr.; and Saunders, Rhoderick K., to Exxon Production Research Company. Oil recovery process utilizing higher alkyl toluene sulfonate. 3,885,626, Cl. 166-273.000.

Gale, Walter W.: *See—*
Reed, Ronald L.; Healy, Robert N.; Stenmark, Donald G.; and Gale, Walter W., 3,885,628.

Gali Mallofre, Salvador. Hairdryers. 3,885,322, Cl. 34-100.000.

Gall, Kurt. Apparatus for treating photographic material in closed cassettes. 3,886,575, Cl. 354-311.000.

Galle, Friedhelm: *See—*
Randebrock, Rudolf; Bollert, Volker; Lukesch, Heinz; Muller, Gertrud; Rappen, Ludwig; and Galle, Friedhelm, 3,886,277.

Gallington, Roger W. Balance type angle of attack indicator. 3,885,431, Cl. 73-180.000.

Gallo, Charles F., Jr., to Xerox Corporation. Method and apparatus for adjusting corotron currents. 3,886,416, Cl. 317-262.00A.

Gallo, Duane Gordon, to Mead Johnson & Company. Ammonium carboxylate sebum inhibition process. 3,886,278, Cl. 424-267.000.

Gallo, Mario: *See—*
Melcher, Domenic; and Gallo, Mario, 3,885,427.

Ganci, James Barry: *See—*
Chen, Carl; and Ganci, James Barry, 3,886,066.

Gargini, Eric John, to Communications Patents Limited. Wired broadcasting systems providing telephone communication. 3,886,456, Cl. 325-308.000.

Garrett Corporation, The: *See—*
Boesel, Walter F., 3,885,302.

Garshenin, Vladimir Vasilievich: *See—*
Akimov, Jury Stepanovich; Galaev, Auli Alexandrovich; Gorelik, Semen Samuilovich; Gofman, Boris Izrailevich; Ermoshin, Vyacheslav Dmitrievich; Korovin, Stanislav Konstaninovich; Naumov, Vladimir Vasilievich; Preobrazhentsev, Konstantin Andreevich; Fronk, Stanislav Vladislavovich; Shvartsman, Vadim Lvovich; Garshenin, Vladimir Vasilievich; Stakhov, Oleg Fedorovich; Kruglov, Igor Ivanovich; and Samokhvalov, Mark Markovich, 3,886,002.

Gea Luftkuhlergesellschaft Happel GmbH & Co. KG: *See—*
Von Cleve, Hans-Henning, 3,885,620.

Gebr. Giulini GmbH: *See—*
Bayer, Gerhard; Cherdron, Egon; Haerter, Manfred; and Hecht, Ernst, 3,886,244.
Bayer, Gerhard; Cherdron, Egon; Haerter, Manfred; and Hecht, Ernst, 3,886,245.

Geffers, Hans; Radt, Walter; Schultz, Hartmut; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. 2-Phosphono-butane-1,2,3,4-tetracarboxylic acids. 3,886,204, Cl. 260-502.40R.

Geffers, Hans; Radt, Walter; Schulz, Hartmut; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. 2-Phosphono-butane-1,2,4-tricarboxylic acids. 3,886,205, Cl. 260-502.40R.

Genakis, Joseph M. Pin tumbler lock. 3,885,409, Cl. 70-364.00A.

General Dynamics Corporation: *See—*
Markum, Arvel Dean, 3,885,939.

General Electric Company: *See—*
Borman, Willem F. H.; and Reilly, Eugene P., 3,886,104.
Cushing, Donald S., 3,885,580.
Graham, Peter H.; and Reece, Paul, 3,886,387.
Hammer, Edward E.; and Kaduk, Edward E., 3,886,396.
Hillig, William B., 3,886,386.
Morris, Edwin E., 3,886,303.
Noone, Michael J., 3,885,980.
Piccone, Dante E.; and Somos, Istvan, 3,886,432.
Reville, John J., 3,885,414.
Stern, Hansjoerg, 3,885,417.
Webb, William M., 3,885,400.
Wolfinger, John F., 3,885,420.
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General Foods Corporation: *See—*
Feldbrugge, Alonzo; Travers, Cynthia; Cloud, William F.; and Rankowitz, Marshall, 3,886,299.
Hayes, John T., Jr.; and Tewey, Robert, 3,886,298.
Parliment, Thomas H.; Clinton, William P.; Scarpellino, Richard; Soukup, Robert J.; and Epstein, Martin F., 3,886,297.

General Motors Corporation: *See—*
Gould, Robert R., Jr., 3,886,539.
Hossenlopp, Arthur M., 3,886,097.
Konantz, Mark L.; and Leisure, Ronald K., 3,886,585.
Park, Kwang H., 3,885,460.

General Signal Corporation: *See—*
Anderson, Robert F., 3,886,406.
Butler, William K.; and Hughson, J. Donald, 3,886,420.
Philibert, Robert A., 3,885,821.

General Tire & Rubber Company, The: *See—*
Fabris, Hubert Jakob; Sponseller, David Ross; Uelzmann, Heinz; and Schmucker, Arden Everett, 3,886,122.

Genthe, James E., to Itek Corp. Capacitor with photo-conductive dielectric. 3,886,415, Cl. 317-258.000.

GeoMetrics: *See—*
Berry, Mark Edward; and Tullsen, Thomas R., 3,886,440.

Georgia-Pacific Corporation: *See—*
Felicetta, Vincent F.; and Wenzel, Donald E., 3,886,101.
Petermann, James P.; Dolinar, William E.; and Ehrlich, Stanley V., 3,885,725.

Gereby, John L.: *See—*
Place, Osmund V.; Hungerford, Philip C., Jr.; and Gereby, John L., 3,885,373.

Gerken, Ralph F.: *See—*
Davenport, Alvan F.; Gerken, Ralph F.; and Wiens, Jacob H., 3,885,324.

Getgen, Lawrence E., to GTE Automatic Electric Laboratories Incorporated. Electric resonant transfer filter. 3,886,316, Cl. 179-15.0AA.

Geusic, Joseph Edward: *See—*
Bonner, William Adam; Geusic, Joseph Edward; and Van Uitert, LeGrand Gerard, 3,886,533.

Gianantonio, Anacleto; and Coco, Antonia, to Gruppo Lepetit S.p.A. Method for the preparation of phthalazino (2,3-B) phthalazine-5(14H), 12(7H)-dione. 3,886,154, Cl. 260-250.00P.

Giangiulio, Clayton. Candle with automatic snuffer. 3,885,905, Cl. 431-34.000.

Gibson, Clarence John; and Kimble, Kenneth, to Kaiser Aerospace & Electronics Corp. Conduit for cryogenic fluid transportation. 3,885,595, Cl. 138-155.000.

Gibson, Joseph D.: *See—*
Cook, Koy B., Jr.; Davidson, Jimmy L.; Gibson, Joseph D.; and Patterson, Raymond B., III, 3,886,584.

Giertz, Hubert: *See—*
Himmele, Walter; Amann, August; Aquila, Werner; Giertz, Hubert; and Siegel, Hardo, 3,886,168.

Gilbert, Kennis W.: *See—*
Knight, Joseph W.; and Gilbert, Kennis W., 3,885,646.

Gilbreth Company: *See—*
Spiegel, William; Spiegel, Jacob; and Miller, Albert (said Miller assors. to), 3,885,667.
Spiegel, William; Spiegel, Jacob; and Miller, Albert, 3,885,671.

Gilbu, Agnar, to Owens-Corning Fiberglas Corporation. Method and apparatus for making a reinforced wall. 3,886,016, Cl. 156-171.000.

Gilleran, Frank M.; and Jorge, Arlindo, to United States of America, Navy. Dual oscillator. 3,886,550, Cl. 343-17.20R.

Gilley, James E., to Keyes Fibre Company. Packaging tray with juice trapping viewing windows. 3,885,727, Cl. 229-2.500.

Gilley, James E., to Keyes Fibre Company. Packaging tray with upper and lower viewing windows. 3,885,728, Cl. 229-2.500.

Gillingham, Warren G.: *See—*
Louder, Nevitt M.; and Gillingham, Warren G., 3,885,879.

Girard, Pierre: *See—*
Colardelle, Joel Serge; Girard, Pierre; and Lerouge, Claude Paul Henri, 3,886,322.

Girling Limited: *See—*
Campbell, Roy; and Price, Anthony George, 3,885,391.
Farr, Glyn Phillip Reginald, 3,885,653.
Taylor, Richard Gerald Meade, 3,885,652.
Wright, Andrew Charles Walden, 3,885,458.

GKN Sankey Limited: *See—*
Edwards, Michael Frederick; and Williams, Edward, 3,885,834.

Gliever, John H.: *See—*
Chu, David C.; and Gliever, John H., 3,886,451.

Glock, Wilfried; and Axthammer, Ludwig, to Fichtel & Sachs AG. Multiple cylinder pump. 3,885,893, Cl. 417-273.000.

Gluck, Adolph M., to Singer Company, The. Synchronization of split site landing systems. 3,886,552, Cl. 343-108.00R.

Go, Tadahiro; and Suzuki, Takashi, to Nippon Zeon Co., Ltd. Aqueous coating composition. 3,886,110, Cl. 260-29.70H.

Gofman, Boris Izrailevich: *See—*
Akimov, Jury Stepanovich; Galaev, Auli Alexandrovich; Gorelik, Semen Samuilovich; Gofman, Boris Izrailevich; Ermoshin, Vyacheslav Dmitrievich; Korovin, Stanislav Konstaninovich; Naumov, Vladimir Vasilievich; Preobrazhentsev, Konstantin Andreevich; Fronk, Stanislav Vladislavovich; Shvartsman, Vadim Lvovich; Garshenin, Vladimir Vasilievich; Stakhov, Oleg Fedorovich; Kruglov, Igor Ivanovich; and Samokhvalov, Mark Markovich, 3,886,002.

Golborn, Peter; and Duffy, James J., to Hooker Chemicals & Plastics Corp. Method of rendering textiles flame retardant with phosphorus containing melamine. 3,885,912, Cl. 8-116.00P.

Goldman, Melvin; and Kronman, Joseph H., to National Patent Development Corporation. Dental treatment. 3,886,266, Cl. 424-53.000.

Goldmann, Bernhard. Elongated, collapsible device. 3,885,881, Cl. 403-291.000.

Goldstein, Raymond: *See—*
Vali, Victor; Krogstad, Reuben S.; and Goldstein, Raymond, 3,886,480.

Golla, Manfred: *See—*
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Gomm, Thiel J.; and Price, Stephen E., to Inex, Inc. Optical inspection apparatus. 3,886,356, Cl. 250-223.00B.

Goodbar, Isaac: *See—*
Stern, Philip; Green, Sanford; and Goodbar, Isaac, 3,885,865.

Goodbary, Edgar R., to Unit Rig & Equipment Co. Elevatable cab for vehicles. 3,885,643, Cl. 180-89.00R.

Goode, George E.: *See—*
Branscome, Kenneth M.; Feath, William M.; Goode, George E.; Heizer, Kenneth W.; and Morgan, Barrie O., 3,886,313.

Goodyear, Michael U.: *See—*
Chaundy, Gerald J.; Ezis, Andre; Goodyear, Michael U.; Howes, Benjamin T.; Johnson, Carl F.; and Styhr, Karsten H., 3,885,294.

Goodyear Tire & Rubber Company, The: *See—*
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Goppen, Albert Adolfovich; Nikolaev, Igor Vladimirovich; Vysotsky, Iosif Fadeevich; Zaslavsky, Mikhail Maximovich; Klushin, Nikolai Alexandrovich; Petreev, Anatoly Mikhailovich; Dronova, Lidia Mikhailovna; Lednikov, Anatoly Ivanovich; Grishenkov, Jury Alexandrovich; and Bashlykov, Jury Mikhailovich. Pneumatic hammer. 3,885,634, Cl. 173-104.000.

Gordin, Myron K., to G & L Industries, Inc. Retractible tool holder. 3,885,308, Cl. 30-162.000.

Gorelik, Semen Samuilovich: *See—*
Akimov, Jury Stepanovich; Galaev, Auli Alexandrovich; Gorelik, Semen Samuilovich; Gofman, Boris Izrailevich; Ermoshin, Vyacheslav Dmitrievich; Korovin, Stanislav Konstaninovich; Naumov, Vladimir Vasilievich; Preobrazhentsev, Konstantin Andreevich; Fronk, Stanislav Vladislavovich; Shvartsman, Vadim Lvovich; Garshenin, Vladimir Vasilievich; Stakhov, Oleg Fedorovich; Kruglov, Igor Ivanovich; and Samokhvalov, Mark Markovich, 3,886,002.

Gorl, Richard; and Blase, Helmut, to Rheinstahl Aktiengesellschaft. Traveling crane construction. 3,885,677, Cl. 212-59.00R.

Gosta Fridlund: *See—*
Fridlund, Karl Gosta; and Jiveman, Jan Urban, 3,885,726.

Gould Inc.: *See—*
Smith, Lynn C.; and Huebscher, Richard G., 3,886,513.

Gould, Robert R., Jr., to General Motors Corporation. Domestic appliance control and display systems. 3,886,539, Cl. 340-337.000.

Gower, Roger L. Hook connector assembly. 3,885,384, Cl. 59-93.000.

Gracia, Robert F.; Laughrey, Richard A.; and Tuohey, Paul F., to Itek Corp. Photosensitive silver halide layers and process. 3,885,966, Cl. 96-50.00R.

Gradeff, Peter S.: *See—*
Desimone, Robert S.; and Gradeff, Peter S., 3,886,215.
DeSimone, Robert S.; and Gradeff, Peter S., 3,886,216.
Desimone, Robert S.; and Gradeff, Peter S., 3,886,217.

Graham, Peter H.; and Reece, Paul, to General Electric Company. Flux shield for dynamoelectric machines. 3,886,387, Cl. 310-256.000.

Graphic Sciences, Inc.: *See—*
Costello, Matthew J.; Dolan, Donald T.; Debaudringhien, Andre T.; Hurkmans, Antoon M.; Jasinski, Kenneth R.; and Keplinger, Edward G., 3,886,308.

Green, Cyril Robert, to Medio, Mario D.; and Medio, Grace E. Foot operation for a pump. 3,885,449, Cl. 74-512.000.

Green, David Thomas. Apparatus for producing a vacuum in a test tube. 3,885,549, Cl. 128-2.00F.

Green, Philip S., to Stanford Research Institute. Apparatus for coupling an array of ultrasonic transducers to an ultrasonic compressional image field and scanning the image field. 3,886,490, Cl. 340-5.0MP.

Green, Sanford: *See—*
Stern, Philip; Green, Sanford; and Goodbar, Isaac, 3,885,865.

Greene, Leonard M., to Safe Flight Instrument Corporation. Vertical speed command instrument. 3,885,430, Cl. 73-179.000.

Gregg, David W.; Kidder, Ray E.; and Biehl, Arthur T., to United States of America, Energy Research and Development Administration. Traveling wave laser system. 3,886,482, Cl. 331-94.50G.

Gregory, Arthur B. Portable livestock feeder/shelter. 3,885,524, Cl. 119-16.000.

Grieger, Gerhard; and Bohrdt, Joaquin, to Siemens Aktiengesellschaft. Fluid actuating device for an electric circuit breaker. 3,885,454, Cl. 91-26.000.

Griffin Bros., Inc.: *See—*
Hall, Robert M., 3,886,099.

Grimes, Alton O.; and Pugh, Frank D., to Bendix Corporation, The. Autopilot radio guidance signal circuit including controlled integrator. 3,885,760, Cl. 244-77.00B.

Grishenkov, Jury Alexandrovich: *See—*
Goppen, Albert Adolfovich; Nikolaev, Igor Vladimirovich; Vysotsky, Iosif Fadeevich; Zaslavsky, Mikhail Maximovich; Klushin, Nikolai Alexandrovich; Petreev, Anatoly Mikhailovich; Dronova, Lidia Mikhailovna; Lednikov, Anatoly Ivanovich; Grishenkov, Jury Alexandrovich; and Bashlykov, Jury Mikhailovich, 3,885,634.

Grishin, Gennady Petrovich: *See—*
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Grob & Co. Aktiengesellschaft: *See—*
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Gross, Daniel M., to Battelle Memorial Institute. Filtering antisolar and heat insulating glass. 3,885,855, Cl. 350-1.000.

Grove, Edward H. Quick couple electric outlet. 3,885,852, Cl. 339-95.00D.

Grove, Hiram D.; and Sauders, Harry A. Boat loading and unloading apparatus. 3,885,689, Cl. 214-450.000.

Groves, Harvey H. Vaginal medicator. 3,885,564, Cl. 128-271.000.

Grunbaum, Gunnar; Wallen, John Erik; Gustafsson, John Kjell; and Widmark, Gustaf, to Sandvik Aktiebolag. Method of producing chromium containing alloys. 3,885,958, Cl. 75-58.000.

Gruppo Lepetit S.p.A.: *See—*
Fontanella, Luigi; and Occelli, Emilio, 3,886,177.
Gianantonio, Anacleto; and Coco, Antonia, 3,886,154.

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Getgen, Lawrence E., 3,886,316.
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Miller, Howard R.; and Putchinski, Leo J., Jr., 3,886,323.
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Guldberg, Jens; and Nathanson, Harvey C., to Westinghouse Electric Corp. Electrostatically deflectable light valve with improved diffraction properties. 3,886,310, Cl. 178-7.50D.

Gulf & Western Industries, Inc.: *See—*
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Gulf & Western Manufacturing Company: *See—*
Reiss, Martin H.; and Solomon, Elias E., 3,886,360.

Gullfiber AB: *See—*
Krook, Soren Sven Olof, 3,885,462.

Gullickson, Cecil F. Single track sight and sound musical instrument instruction device. 3,885,490, Cl. 84-470.000.

Gun, Dmitry Rudolfovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Gun, Dmitry Rudolfovich; Kantor, Ilya Solomonovich; Kakhniashvili, Avtandil Semenovich; Topolyansky, Jury Arnoldovich; Suladze, Ippolit Davidovich; and Tsimbler, Jury Abramovich, 3,885,757.

Gurta, Daniel J.; and Koss, George A., to Ford Motor Company. Apparatus for expanding a laminating interlayer. 3,885,899, Cl. 425-150.000.

Gurtner S.A.: *See—*
Iung, Jacques, 3,885,589.

Gustafsson, John Kjell: *See—*
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Haas, Roger A.; Chenausky, Peter P.; and Freiberg, Robert J., to United States of America, Energy Research and Development Administration. Laser plasma diagnostic using ring resonators. 3,885,874, Cl. 356-107.000.

Haase, Kurt H., to United States of America, Air Force. Templates for switch setting in computer control. 3,886,337, Cl. 200-46.000.

Habermann, Helmut, to Societe Europeenne de Propulsion. Magnetic bearing. 3,885,839, Cl. 308-10.000.

Habermeier, Jurgen; and Kunz, Walter, to Ciba-Geigy Corporation. Polyesteramides based on bis-aminoalkyl hydantoins or dihydrouracils. 3,886,123, Cl. 260-75.00N.

Habi-Chek Corporation: *See—*
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Habib, Emile E., to Deering Milliken Research Corporation. Textile material with soil release. 3,885,911, Cl. 8-115.600.

Hacker, Joseph Michael, to Western Electric Company, Incorporated. Manufacturing filled cable. 3,885,380, Cl. 57-162.000.

Hadermann, Albert F.; and Waters, Paul F. Apparatus for determining the water content of liquids and gases. 3,885,916, Cl. 23-253.00R.

Hadzimihalis, Theodore M., to Bell & Howell Company. Convertible projector with door actuated mirror. 3,885,868, Cl. 353-71.000.

Haeger, Virgil J. Foldable table and bench assembly. 3,885,829, Cl. 297-159.000.

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Bayer, Gerhard; Cherdron, Egon; Haerter, Manfred; and Hecht, Ernst, 3,886,245.

Hafner, Otto P. Method of interlocking overlying sheets. 3,885,299, Cl. 29-521.000.

Hakuju Institute for Health Science Co., Ltd.: *See—*
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Hall, Robert M., to Griffin Bros., Inc. Water soluble flux remover. 3,886,099, Cl. 252-548.000.

Hallmark Cards, Incorporated: *See—*
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Halpern, Alfred, to Synergistic. Iodophor-steroid compound pharmaceutical compositions. 3,886,268, Cl. 424-80.000.

Hamano, Suenobu: *See*—
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Hamon, Emile F. J., to Etat Francais, Delegation Ministerielle pour l'Armement. Pyrotechnically controlled mechanical stepping drive. 3,885,451, Cl. 89-1.00B.

Hanamoto, Max M.: *See*—
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Handy, Edward F.: *See*—
Braun, William V.; and Handy, Edward F., 3,886,554.

Hankes, Robert W.; Schramm, Eugene J.; Spiker, James C.; and Tober, Frank T., to Somat Corporation. Waste pulping machine with replaceable shear members. 3,885,745, Cl. 241-46.110.

Hanold, Robert J.: *See*—
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Hans Schwarzkopf GmbH: *See*—
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Hansen, Robert C.: *See*—
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Hanson, John P., to United States of America, Energy Research and Development Administration. Hydraulic load matching device. 3,885,393, Cl. 60-583.000.

Haptonstall, Jimmie L. Combination vehicle and boat. 3,885,693, Cl. 214-516.000.

Hara, Akikuni, to Hakuju Institute for Health Science Co., Ltd. Therapeutical apparatus applying superposed output of DC and AC voltages. 3,885,573, Cl. 128-420.000.

Haraikawa, Tetsuo. Dual brake system. 3,885,392, Cl. 60-581.000.

Hardtmann, Goetz E., to Sandoz, Inc. 2-Piperazino-3-cyano-5-phenylpyridines. 3,886,161, Cl. 260-268.00H.

Harms, A. D., Jr.; Hemphill, Robert B.; Balthrop, Chris A.; and Peter, Harley D., to E-Systems Inc. Electro-optical reader. 3,886,328, Cl. 235-61.11E.

Harrigan, Roy M. Dynamic muffler. 3,885,645, Cl. 181-49.000.

Harris Corporation: *See*—
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Harris, David Michael; Harvey, James Albert; and Clipston, John Alfred, to Caledonian Mining Company Limited. Apparatus for preparing and dispensing mixtures of concrete and fibres. 3,885,774, Cl. 259-165.000.

Harris, Rano J., Jr.: *See*—
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Harris, Rano J., Sr.; and Harris, Rano J., Jr. Automatic fluid injector. 3,885,438, Cl. 73-422.0GC.

Harris, Richard A. Jump-over amusement ride. 3,885,788, Cl. 272-55.000.

Harris, Robert C., Jr.: *See*—
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Harris, Walter L. Ski attachment for motorcycles. 3,885,641, Cl. 180-5.00R.

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Hartmann, Clinto Sylvester; and Rosenfeld, Ronald Carl, to Texas Instruments Incorporated. Acoustic surface wave resonator devices. 3,886,504, Cl. 333-72.000.

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Harvey, James Albert: *See*—
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Hasegawa, Akira, to Yoshida Kogyo Kabushiki Kaisha. Stringer structure for slide fasteners. 3,885,275, Cl. 24-205.16R.

Hassan, Javathu K.; Rabstejnek, Carl V.; and Wutka, Anthony D., to International Business Machines Corporation. Precision tool and workpiece positioning apparatus with ringout detection. 3,886,421, Cl. 318-593.000.

Hassencahl, Lloyd J.; Chernick, Leon; Jonokuchi, James N.; Katz, Joel; and Wooley, Richard L., to United States of America, Navy. Missile radar doppler processing unit. 3,886,461, Cl. 328-140.000.

Hatano, Itaru: *See*—
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Haubner, Georg; Hofer, Walter; and Schmaldienst, Peter, to Robert Bosch G.m.b.H. Engine ignition system adapted to prevent engine rotation in the wrong direction. 3,885,542, Cl. 123-148.00E.

Hauck, Erwin A.: *See*—
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Hauni-Werke Korber & Co. KG: *See*—
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Hauser, Ivo; and Hiltbrunner, Werner, to Societe d'Assistance Technique pour Produits Nestle S.A. Method and apparatus for creating a sub-atmospheric pressure inside closed containers. 3,885,510, Cl. 113-1.00G.

Hauswirth, Vernon O., to Ford Motor Company. Deceleration device and valve mechanism. 3,885,654, Cl. 188-284.000.

Havinga, Reginoldus; and Swaters, Pieter Dirk, to Koninklijke Industrieele Maatschappij Noury and Van Der Lande N.V. Ultraviolet light stabilizers. 3,886,117, Cl. 260-45.85N.

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Heimberger, Helmut, to Opti-Holding AG. Slide fastener. 3,885,273, Cl. 24-205.13D.

Heizer, Kenneth W.: *See*—
Branscome, Kenneth M.; Feath, William M.; Goode, George E.; Heizer, Kenneth W.; and Morgan, Barrie O., 3,886,313.

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Helland, Arvid Frimann. Door handle. 3,885,269, Cl. 16-110.00R.

Hellberg, Patric C-O.: *See*—
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Hellerbach, Joseph; and Walser, Armin, to Hoffmann-La Roche Inc. Benzodiazepin-2-ones and processes for the preparation thereof. 3,886,214, Cl. 260-562.00N.

Helsley, Grover Cleveland, to A. H. Robins Company, Incorporated. 5-(3-)substituted-10,11-dihydro-5H-dibenz[b,f]azepines. 3,886,170, Cl. 260-293.590.

Helszajn, Joseph, to Microwave Development Laboratories, Inc. Waveguide circulator having single gyromagnetic element. 3,886,497, Cl. 333-1.100.

Hemming, Raymond Charles, to Northern Electric Company Limited. Adaptable mounting for alternative forms of telephone dials. 3,886,324, Cl. 179-178.000.

Hemphill, Robert B.: *See*—
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Hempling, Norman G., to United States of America, Air Force. Video slope rate detector. 3,886,551, Cl. 343-18.00E.

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Hutchinson, Francis Gowland; Henbest, Richard George Cleveland; and Leggett, Margaret Kenley, 3,886,229.

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Herkner, Edward C. Fishing lure body. 3,885,339, Cl. 43-42.050.

Herman, Jack J. Scissors and position indicator. 3,885,306, Cl. 30-123.00R.

Herzl, Peter J., to Fischer & Porter Company. Vortex-type mass flowmeters. 3,885,432, Cl. 73-194.00B.

Hesson, Christer Ragnar: *See—*
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Hester, Jackson B., Jr., to Upjohn Company, The. 1-Substituted-6-phenyl-4H-s-triazolo[4,3-a][1,4]benzodiazepines. 3,886,174, Cl. 260-308.00R.

Hester, Jackson B., Jr.; and Szmuszkovicz, Jacob, to Upjohn Company, The. 9H-Dibenzo(b,f)-s-triazolo(4,3-d)(1,4)diazepines. 3,886,175, Cl. 260-308.00R.

Hetzel, Max; and Kocher, Hans, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Reduced friction watch cannon shafts. 3,885,382, Cl. 58-138.000.

Heusinger, Peter-Paul: *See—*
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Heyck, Hans D. Capacitive pressure and displacement transducers. 3,886,473, Cl. 331-42.000.

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Hibbard, Haines C.: *See—*
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Hicks, J. Byron, to Hydro-Catalyst Corp. Precombustion catalyst device for use with an internal combustion engine employing a vaporizable liquid fuel and an engine utilizing such a device. 3,885,539, Cl. 123-119.00E.

Hicks, John Evan Philip: *See—*
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Hildebrandt, Ullrich, to Linde Aktiengesellschaft. Terminal for low-temperature cable. 3,885,636, Cl. 174-15.00C.

Hildemann, Victor R. Telescope mounting. 3,885,858, Cl. 350-83.000.

Hill, A. C., to Teledyne Exploration Company. Streamer manufacture. 3,885,286, Cl. 29-203.00D.

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Hindin, Herbert B.; Johnson, Alfred E.; and Knapp, Donald P., to Oliver Tire & Rubber Company. Apparatus for recapping tires with precured tread rubber. 3,886,028, Cl. 156-394.000.

Hines, Mildred Elizabeth. Lightweight collapsible loom. 3,885,597, Cl. 139-29.000.

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Hodler, Fritz. Ventilation valve for closing a ventilation duct in a casting mold. 3,885,618, Cl. 164-305.000.

Hodson, Stuart Arthur; and Marshall, John. Method for transfer of freeze-dried specimens. 3,885,320, Cl. 34-5.000.

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Hofer, Wolfgang; Lurssen, Klaus; and Schmidt, Robert Rudolf, to Bayer Aktiengesellschaft. Plant growth regulant compositions containing 2-haloethanesulphinic acid compounds. 3,885,951, Cl. 71-103.000.

Hofer, Wolfgang; Hammann, Ingeborg; Homeyer, Bernhard; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. 0-(4-Methyl-5-methylmercaptopyrimidin-6-yl)(thiono)-phosphoric(phosphonic) acid esters or ester amides. 3,886,156, Cl. 260-251.00P.

Hoffman, Arnold: *See—*
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Hoffman, Frank A.; and Hinson, Layton L., to Arvin Industries, Inc. Method of making a panel corner. 3,885,300, Cl. 29-527.100.

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Hofmann, Eberhard: *See—*
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Hofmann, Richard E.; and Walters, Francis R. Food casing and method of making it. 3,885,508, Cl. 112-262.000.

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Hoshina, Naomi; and Suzuki, Etsuji, to Tokyo Shibaura Electric Co., Ltd. Control system having actual backlash compensating apparatus. 3,886,424, Cl. 318-630.000.
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Klayum, Milton A., to Reliable Electric Company. Line protector having gas tube surge arrestor. 3,886,411, Cl. 317-62.000.
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Kriebel, Anthony R. Method and apparatus for detecting the presence of an oil slick on a water surface. 3,885,418, Cl. 73-61.10R.
Krieks, Hans. Knock-down furniture system. 3,885,845, Cl. 312-265.000.
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Lach, Ronald Louis; and Brier, William Jean, to Elec-Tro-Tec, Inc. Dispatching system circuit. 3,886,414, Cl. 317-137.000.
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Lai, Thomas K. Y. Light and chime control system. 3,886,352, Cl. 250-215.000.
Lamm, Heinz; and Kortner, Lothar, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine with unitary or multi-partite sealing bar. 3,885,898, Cl. 418-122.000.
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Large, George B.; and Pitt, Leland S., to Stauffer Chemical Company. Certain thiophosphate synergists. 3,886,273, Cl. 424-200.000.

Larsen, Albert Johannes. Device for laying flagstones. 3,885,688, Cl. 214-384.000.

Lauenborg, Jan Tronje. Arrangement relating to ship hulls. 3,885,514, Cl. 114-66.50R.

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Laukien, Gunther Rudi. Method of separating broad and narrow lines of a frequency spectrum. 3,886,439, Cl. 324-.50R.

Lavedan, Louis J., Jr., to United States of America, Navy. Insertion and differential phase-trim method. 3,886,501, Cl. 333-24.100.

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Lebel, Constantin Erwin; and Karmitz, Pierre Ilie Isidore. Containers for aerosols, gases and the like. 3,885,698, Cl. 220-69.000.

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Lee, David Q.; and McLaughlin, Donald W., to GTE Automatic Electric Laboratories Incorporated. Arrangement and method of signalling both ways through a two wire electronic junctor. 3,886,315, Cl. 179-18.0AH.

Lee, Poy. Winter emergency brake system. 3,885,823, Cl. 291-15.000.

Lefeuvre, Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Lockable slide fitting for a safety belt system. 3,886,374, Cl. 307-10.0SB.

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Leland, James M. Programmable pulse electroplating process. 3,886,053, Cl. 204-36.000.

Lemieux, Pierre C. Blacktop cutter attachment. 3,885,833, Cl. 299-36.000.

Leorat, Francois Jean-Louis; and Mouttet, Andre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Pressure regulation control valve for an hydraulic control system of an automatic power transmission. 3,885,476, Cl. 74-863.000.

Lepakhin, Igor Alexandrovich: *See—*
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Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique. Fiber toration; method and equipment. 3,885,940, Cl. 65-5.000.

Leveen, Harry H. Wound splints. 3,885,570, Cl. 128-335.000.

Levin, Alfred A.; and Richter, Sidney B., to Velsicol Chemical Corporation. N-phenoxyalkyl-L-thiocyanoalkanamides. 3,886,194, Cl. 260-454.000.

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Levy, Raymond L., to Varian Associates. Liquid toner concentrate dispenser having a valve responsive to hydrostatic pressure. 3,885,709, Cl. 222-133.000.

Levy, Raymond L.; and Day, Gene F., to Varian Associates. Device for discharging charge accumulated between the recording medium and a photoconductive plate in an electrophotographic recorder. 3,885,870, Cl. 355-14.000.

Lewis, David W.: *See—*
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Li, Tao P., to Monsanto Company. Oxidation and ammoxidation catalyst. 3,886,096, Cl. 252-456.000.

Libit, Sidney M. Childproof closures of the pull-push type. 3,885,712, Cl. 222-153.000.

Libutti, Bruce L., to Betz Laboratories Inc. Alumina as a cold-end additive. 3,886,261, Cl. 423-244.000.

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Limebeer, Gerald John Nicholson, to Lund, Basil Gilbert Alfred, a part interest. Heat exchangers. 3,885,936, Cl. 62-304.000.

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List, Ferdinand; Alfs, Helmut; Wember, Kurt; and Orlowski, Friedrich-August, to Chemische Werke Huls Aktiengesellschaft. Process for the preparation of terephthalic acid dimethylester. 3,886,200, Cl. 260-475.00R.

Lloyd, Lester John, to Ball Computer Products, Inc. Optical character reader scanning support mechanism. 3,886,371, Cl. 250-567.000.

Lodge, Edward H., to Bell and Howell Company. Cassette pusher velocity regulator. 3,885,706, Cl. 221-279.000.

Loffelman, Frank Fred, to American Cyanamid Company. N-benzoylsaccharin as peroxygen bleach activator. 3,886,078, Cl. 252-102.000.

Lohmann, Heinz-Juergen, to Siemens Aktiengesellschaft. Electronic storage circuit for digital data processing devices with high fault safety in particular for railroad safety systems. 3,886,381, Cl. 307-238.000.

Lohr, Delmar F., Jr.; Kay, Edward Leo; and Hausch, Walter Richard, to Firestone Tire & Rubber Company, The. Stabilization of polybutadiene resin. 3,886,106, Cl. 260-23.70M.

Lokun, Terence M.; and Poulsen, Peder Ulrik, to Owens-Corning Fiberglas Corporation. Band overlap detector switch for continuous ribbon mandrel. 3,886,338, Cl. 200-61.130.

Long, Robert Alvin; Lucas, Joel William; Over, William Roderick; and Doty, Donald Sudson, to AMP Incorporated. Harness manufacturing apparatus incorporating harness testing means. 3,885,287, Cl. 29-203.0MW.

Long, Ronald Edwin, to Lester Electrical of Nebr., Inc. Battery charger control circuit. 3,886,427, Cl. 320-22.000.

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Lorber, Harold; and Duboff, Irving, to Hilabs Company. Magnetically enhanced coaxial cable with improved time delay characteristics. 3,886,506, Cl. 333-96.000.

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Louis, Eckhart: *See—*
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Lowry, Robert D., to Lowry Development Corporation. Security caps for containers. 3,885,715, Cl. 222-182.000.

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MacClaren, Robert H., to Xerox Corporation. Photographic and electrophotographic members with glass fiber containing paper substrates. 3,885,962, Cl. 96-1.800.

MacDonald, William; Webb, George; Waldburger, Peter; and Hughes, Robert G., to Continental Can Company of Canada Limited. Method and apparatus for applying a cutting strip to a container. 3,886,033, Cl. 156-522.000.

MacDonald, William E.; and Harris, Robert C., Jr., to Interpace Corporation. Method and apparatus of decorating a surface of an article. 3,885,522, Cl. 118-406.000.

Macharg, James Adrian. Electronic control system for battery chargers. 3,886,428, Cl. 320-39.000.

Machuszek, Joseph A.: *See—*
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Machuszek, Joseph M.: *See—*
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MacLeod, Patrick, to Commissariat a l'Energie Atomique. Method and device for differential olfactometry. 3,885,550, Cl. 128-2.00R.

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Madden, John W.: *See—*
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Maddox, Harry L., to Western Electric Company, Incorporated. Oscillator circuit for generating an output signal having successive cycles which unidirectionally vary in frequency. 3,886,486, Cl. 331-111.000.

Madsen, Jens Hilligso. Underground mining arch gateway system. 3,885,395, Cl. 61-45.00R.

Maffey, Alan Loader, Lord Rugby. Handling of livestock. 3,885,527, Cl. 119-98.000.

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Magnie, Robert L. Carrier device for hanger supported garments. 3,885,723, Cl. 224-45.00T.

Maher, Galeb H., to Sprague Electric Company. Method of forming a glass-reacted-ceramic component. 3,885,941, Cl. 65-18.000.

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Majeau, Henrie Lionel; and Fitzsimmons, George Washington, to Boeing Company, The. Responder for use in a passive identification system. 3,886,548, Cl. 343-6.80R.

Makar, Francis B., Jr.: *See—*
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Maki, Robert E. Snowshoe binder. 3,885,327, Cl. 36-2.5AB.

Malmendier, Joseph W.; and Sojka, Joseph E., to Corning Glass Works. Low melting vanadate glasses. 3,885,975, Cl. 106-47.00R.

Maloney-Crawford Tank Corporation: *See—*
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Maloney, Thomas C.; Cola, Rudolph A.; and Wescott, Ronald O., to Burroughs Corporation. Buttable, gaseous discharge, display panel including electrodes providing a dot matrix display. 3,886,390, Cl. 313-217.000.

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Mann, Yale M. Alarm booth. 3,886,536, Cl. 342-304.000.

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Manning, Francis S.; Buthod, Paul; Hodgson, Robert A.; and Bagci, Ibrahim, to Maloney-Crawford Tank Corporation. Modified calcium chloride brine desiccant. 3,885,926, Cl. 55-29.000.

March, Harry V.: *See—*
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Marcus, Erich, to Union Carbide Corporation. Polyester blends containing a di(hydroxyalkyl) amine modified polyester. 3,886,230, Cl. 260-860.000.

Marechal, Claude, to Ciments Lafarge S.A. Appliance to measure out a given volume of powder. 3,885,716, Cl. 222-346.000.

Marin, Robert E., to Teletype Corporation. Debounce logic for keyboard. 3,886,543, Cl. 340-365.00E.

Markovac, Anica: *See—*
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Marshall, John R., to Ford Motor Company. Recirculating exhaust gas load initiated control (relic). 3,885,536, Cl. 123-119.00A.

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Martineau, Jean; and Biechler, Francois-Joseph, to Seppic. Method for combatting pollution using a chromium complex. 3,886,070, Cl. 210-47.000.

Martinec, John P.: *See—*
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Marvin Glass & Associates: *See—*
Breslow, Jeffrey D., 3,885,792.
Morrison, Howard J.; and Nix, Donald F., 3,885,342.

Marzluff, William Frank: *See—*
Fetchin, John Allan; Marzluff, William Frank; and Barber, William Austin, 3,886,213.

Marzoli, Angelo, to Folli Marzoli & C.S.P.A. Pneumatic cleaning plant for drawing systems in spinning preparation machines and spinning machines. 3,885,272, Cl. 19-245.000.

Mashimo, Yukio: *See—*
Yazaki, Mutsunobu; Mashimo, Yukio; and Matsuda, Mutsuhide, 3,886,568.

Mason, Peter John, to Xerox Corporation. Flat bed facsimile scanners. 3,886,309, Cl. 178-7.600.

Massachusetts Institute of Technology: *See—*
Huber, Ernest E.; Cohen, Mitchell S., Jr.; and Smith, Donald O., 3,886,530.

Massani, Massimo; and Di Gesaro, Giuseppe, to Selenia-Industrie Elettroniche Associate S.p.A. Electronically tunable gunn oscillator with automatic frequency control. 3,886,471, Cl. 331-10.000.

Massey, James E., Jr.: *See—*
Kivlen, John A.; Massey, James E., Jr.; and Martin, James H., Jr., 3,885,530.

Massie, Harold Lee, to Hoffmann-La Roche Inc. Artifact rejection for blood pressure monitoring. 3,885,551, Cl. 128-2.05A.

Masterson Enterprises, Inc.: *See—*
Maxwell, William J., 3,885,666.

Masuda, Takao: *See—*
Ikenoue, Shinpei; and Masuda, Takao, 3,885,968.
Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; and Shishido, Tadao, 3,885,967.

Masutani, Mitsumasa: *See—*
Flogaus, William S.; and Masutani, Mitsumasa, 3,885,857.

Masuzawa, Isao; Kawada, Shin-ichi; Hirokawa, Yoichi; and Sato, Masatoshi, to Kabushikikaisha Tokyo Keiki. Servo apparatus. 3,886,422, Cl. 318-621.000.

Masuzawa, Isao; Kawada, Shin-ichi; Hirokawa, Yoichi; and Sato, Masatoshi, to Kabushikikaisha Tokyo Keiki. Servo apparatus. 3,886,423, Cl. 318-621.000.

Mathieu, Thomas A. Dredging barge having digging jets and steering jets. 3,885,331, Cl. 37-63.000.

Matolcsy, Gyorgy: *See—*
Dory, Istvan; Feuer, Laszlo; Javor, Andras; and Matolcsy, Gyorgy, 3,886,283.

Matsuda, Mutsuhide: *See—*
Yazaki, Mutsunobu; Mashimo, Yukio; and Matsuda, Mutsuhide, 3,886,568.

Matsui, Katsuaki: *See—*
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Horiuchi, Hideo; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,886,115.

Matsukawa, Hiroharu: *See—*
Kiritani, Masataka; Matsukawa, Hiroharu; Watanabe, Akio; and Imamiya, Hitoshi, 3,886,085.

Matsumoto, Ken; and Archer, Robert A., to Eli Lilly and Company. Aminodibenzo(b,d)pyrans. 3,886,184, Cl. 260-345.300.

Matsumoto, Seichi; Hosoe, Kazuya; and Sunouchi, Akio, to Canon Kabushiki Kaisha. Optical system position controlling device. 3,886,567, Cl. 354-25.000.

Matsumoto, Shigeo; Tsuda, Yukio; and Tsuyuki, Tadaharu, to Sony Corporation. Frequency converter circuit with integrated injection capacitor. 3,886,458, Cl. 325-439.000.

Matsumoto, Yoshio; Shirai, Michiko; Saito, Hiroko; Kawashima, Takeshi; and Sakabe, Yuzuru, to Kitazato Gakuen. Preparing purified macromolecular soluble prussian blue. 3,885,921, Cl. 23-300.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Amagami, Keizo; Takahashi, Yutaka; Nawa, Motoyuki; Kawabata, Norio; Nishibayashi, Nobuhiko; and Sasada, Katsumi, 3,885,736.
Fujieda, Hiroshi; and Yamamoto, Taro, 3,885,902.
Nasu, Takuya, 3,886,589.
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Matsushita Electric Works, Limited: *See—*
Doi, Kazuo; Nakajima, Jun; Shodai, Masahiko; Uchimura, Junichi; Wada, Takeaki; and Shibata, Zenzaburo, 3,885,978.

Matsuzaki, Tetsuo: *See—*
Ota, Hiroshi; and Matsuzaki, Tetsuo, 3,885,353.

Mattfeld, Johann, to Licentia Patent-Verwaltungs-G.m.b.H. Class B push-pull output stage of an amplifier. 3,886,465, Cl. 330-15.000.

Maurer, Edgar A.; and Diehl, Arne J., to Hoover Company, The. Floor care appliance handle with a button-operated piston and cylinder. 3,885,267, Cl. 15-339.000.

Mavrovic, Ivo. Urea synthesis with improved heat recovery and ammonium carbamate recirculation. 3,886,210, Cl. 260-555.00A.

Mawdsley, Thomas Blackburn; and Whittle, Albert, to Carrington Viyella Limited. Shuttleless weaving looms. 3,885,599, Cl. 139-127.00P.

Maxwell, William J., to Masterson Enterprises, Inc. Storage device for palettes containing air drying paints and values. 3,885,666, Cl. 206-1.700.

May, Albert: *See—*
Bartholome, Ernst; Koehler, Waldemar; Stoeckelmann, Guenter; and May, Albert, 3,886,187.

Mayer, Peter: *See—*
Breitweg, Peter; Franz, Karl-Heinz; Mayer, Peter; and Wolf, Klaus, 3,885,496.

Mayr, Hubert: *See—*
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Mazzoni, Renato J.: *See—*
Bowser, George H.; Mazzoni, Renato J.; and Martinec, John P., 3,886,013.

McBride, Kenneth L. Fire suppressing system. 3,885,631, Cl. 169-11.000.

McCallum, Robert D.: *See—*
Krasin, Lester Q.; and McCallum, Robert D., 3,886,321.

McCaully, Ronald J.; Nudelman, Abraham; and Bell, Stanley C., to American Home Products Corporation. 1,3-Dihydro-3 -hydroxy-5-phenyl-2H-1,4-benzodiazepin-2-one, substituted diamino acetate esters and their acid salts in compositions and methods for inducing a calming effect. 3,886,276, Cl. 424-250.000.

McClain, Andrew J. Apparatus for sorting, carrying and delivering mail or the like. 3,885,668, Cl. 206-73.000.

McFarlan, Alden I. Air conditioning system and control including method and means. 3,885,619, Cl. 165-26.000.

McGrath, Colin: *See—*
Penhallurick, Mervyn Major; and McGrath, Colin, 3,885,463.

McGregor, John: *See—*
Ferguson, Alisdair Cullen; McGregor, John; and MacPherson, Alastair George, 3,886,523.

McGregor, Matthews, to Robert McGregor & Sons Limited. Method for forming holes in concrete slabs and pavements. 3,886,242, Cl. 264-31.000.

McHenry, Vincent J.: *See—*
Cheal, James; and McHenry, Vincent J., 3,886,549.

McKenna, Lawrence W., Jr., to Monsanto Company. Solutions of pressure-sensitive resin solutions with improved viscosity and flow. 3,886,126, Cl. 260-80.730.

McKinley, Wayne A.; and Sarantakis, Dimitrios, to American Home Products Corporation. P-GLU-D-PHE-TRP-SER-TYR-D-PGL-LEU-ARG-PRO-GLY-NH_2 and intermediates. 3,886,135, Cl. 260-112.500.

McLain, Charles D., to Olin Corporation. Heat exchanger tube. 3,885,622, Cl. 165-179.000.

McLarrin, Robert B. Multiproportion beam scales for measuring equal volumes of materials having different specific gravities. 3,885,639, Cl. 117-172.000.

McLaughlin, Donald W.: *See—*
Lee, David Q.; and McLaughlin, Donald W., 3,886,315.

McLaughlin, John F.; and Cristy, Stephen S., to United States of America, Energy Research and Development Administration. Specimen transfer container for ion microprobe mass analyzer. 3,886,358, Cl. 250-289.000.

McNease, Wilbern W.: *See—*
Austin, Dennis R.; and McNease, Wilbern W., 3,886,418.

McNeil Corporation: *See—*
Weitzel, George; and Devries, Wayne J., 3,885,713.

McNeill, Jon L., to Texas Instruments Incorporated. Schottky loaded emitter coupled memory cell for random access memory. 3,886,531, Cl. 340-173.00R.

McPeak, Earl W., Jr.: *See—*
Canup, Robert E.; and McPeak, Earl W., Jr., 3,886,510.

McPherson, Robert G.: *See—*
Nelson, Alfred M.; McPherson, Robert G.; and Martin, Maurice S., 3,885,867.

McRowe, Arthur W., to B. F. Goodrich Company, The. Potassium zinc cuprocyanide. 3,886,262, Cl. 423-364.000.

McWilliams, Joseph E. Mail bag handling apparatus. 3,885,682, Cl. 214-6.00G.

Mead Johnson & Company: *See—*
Gallo, Duane Gordon, 3,886,278.
Wu, Yao Hua; and Ryan, Richard P., Jr., 3,886,165.

Measurex Corporation: *See—*
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Medio, Grace E.: *See—*
Green, Cyril Robert, 3,885,449.

Medio, Mario D.: *See—*
Green, Cyril Robert, 3,885,449.

Megyeri, Mihaly; and Molnar, Jeno. Method for measuring the rheological properties of fluids in the bore holes of deep-wells. 3,885,429, Cl. 73-153.000.

Mehltretter, Charles L.: *See—*
Kissell, Leo T.; Hanamoto, Max M.; and Mehltretter, Charles L., 3,886,292.

Meiattini, Franco. Process for the enzymatic determination of glucose with a glucose-oxidase/peroxidase enzyme system. 3,886,045, Cl. 195-103.500.

Meier, Udo H., to Reliance Electric Company. Phase and frequency synchronizing circuit. 3,886,430, Cl. 321-9.00A.

Meier, Udo H., to Reliance Electric Company. Synchronizing circuit having an infinite number of ratios. 3,886,431, Cl. 321-9.00A.

Melcher, Domenic; and Gallo, Mario, to Wirth, Gallo and Company. Electronic balance for measuring masses or forces. 3,885,427, Cl. 73-141.00R.

Mellert, Arnold, to B & W. Filterfabrik Johannes Weber KG. Prism arrangement. 3,885,863, Cl. 350-196.000.

Mellor, Harrison Clay. Linear bearing having replaceable insert. 3,885,837, Cl. 308-3.00R.

Melvin Corporation: *See—*
Hull, James S., 3,885,389.

Menn, Julius J.: *See—*
Pallos, Ferenc M.; and Menn, Julius J., 3,886,148.

Menzel, Klaus, to Bendix Corporation, The. Two-speed mechanical quill feed and spindle drive mechanism for a machine tool. 3,885,635, Cl. 173-146.000.

Menzel, Stanley W. O., to Iplex Plastic Industries Pty. Ltd. Attachment of drip feed devices to hoses or the like. 3,885,742, Cl. 239-272.000.

Merck & Co., Inc.: *See—*
Inamine, Edward; and Birnbaum, Jerome, 3,886,044.

Merianos, John J.; and Adams, Phillip, to Millmaster Onyx Corporation. Amino derivatives of terrasubstituted benzene compounds. 3,886,284, Cl. 424-330.000.

Merkin, Eugene, to Union Corporation, The. Protective sleeve for refuse handling apparatus. 3,885,467, Cl. 100-229.00A.

Metro Data Corporation: *See—*
Dalke, James A., 3,886,588.

Metz, Paul: *See—*
Obst, Karl-Heinz; Stradtmann, Jurgen; Metz, Paul; and Meyer, Francis, 3,885,956.

Metzger, Jacques: *See—*
Petinaux, Marcel; Metzger, Jacques; Aune, Jean-Pierre; and Knoche, Hubert, 3,886,178.

Meyer, Charles A., to Westinghouse Electric Corp. Temperature detecting system. 3,885,436, Cl. 73-339.00A.

Meyer, Erwin: *See—*
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Meyer, Francis: *See—*
Obst, Karl-Heinz; Stradtmann, Jurgen; Metz, Paul; and Meyer, Francis, 3,885,956.

Meyer, Martin H.: *See—*
Borst, Gaylord M.; and Meyer, Martin H., 3,885,517.

Meyers, Peter G., to Meyers Systems and Technology, Inc. Reheating and reconstitution apparatus. 3,886,346, Cl. 219-386.000.

Meyers Systems and Technology, Inc.: *See—*
Meyers, Peter G., 3,886,346.

Michling, Wilhelm; and Rauscher, Heinz, to Mannesmann-Meer AG. Winch with gearing and brake inside of a closed drum. 3,885,656, Cl. 192-4.00R.

Michnowicz, John A.: *See—*
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Microwave Development Laboratories, Inc.: *See—*
Helszajn, Joseph, 3,886,497.

Midland Insta-Change Company: *See—*
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Mikulski, Walter E., to United Aircraft Corporation. Guide for electrochemical drilling. 3,886,059, Cl. 204-224.00M.

Miley, George H., to United States of America, Energy Research and Development Administration. Plasma pumped laser. 3,886,483, Cl. 331-94.50P.

Miller, Albert: *See—*
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Spiegel, William; Spiegel, Jacob; and Miller, Albert, 3,885,671.

Miller, Calvin L.; and Knell, Harvey A., to Caterpillar Tractor Co. Final drive mounting for a track-type vehicle. 3,885,642, Cl. 180-9.20R.

Miller, Howard R.; and Putchinski, Leo J., Jr., to GTE Automatic Electric Laboratories Incorporated. Method and apparatus for testing communications switching system space divided equipment supervisory devices. 3,886,323, Cl. 179-175.20R.

Miller, Lawrence J.; and Smith, Roger M., to Caterpillar Tractor Co. Tether band for flexible hydraulic hoses. 3,885,816, Cl. 280-421.000.

Miller, Ralph R., III: *See—*
Caldwell, Hamlin A., Jr.; and Miller, Ralph R., III, 3,885,515.

Miller, Ralph W., to TRW Inc. Bipolar transistor construction method. 3,885,994, Cl. 148-1.500.

Milling, Robert W., to United States of America, Air Force. Multicomponent flow injector pump for a flowing gas laser with low output pressure. 3,886,478, Cl. 331-94.50G.

Millmaster Onyx Corporation: *See—*
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Mineev, Evgeny Nikolaevich: *See—*
Miroshnikov, Mikhail Mikhailovich; Mineev, Evgeny Nikolaevich; Karapetian, Konrad Saakovich; Ivanova, Roza Nikolaevna; Romanov, Vasily Vasilievich; Kurnakov, Sergei Nikolaevich; Khutoretsky, Garri Mikhailovich; Elin, Ivan Ivanovich; Bykov, Valentin Mikhailovich; and Valchikhin, Dmitry Dmitrievich, 3,886,362.

Mines de Potasse d'Alsace S.A.: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
Ikeuchi, Takeshi, 3,885,750.

Miranda, Salvatore W. Process for controlling oil slicks. 3,886,067, Cl. 210-40.000.

Miroshnikov, Mikhail Mikhailovich; Mineev, Evgeny Nikolaevich; Karapetian, Konrad Saakovich; Ivanova, Roza Nikolaevna; Romanov, Vasily Vasilievich; Kurnakov, Sergei Nikolaevich; Khutoretsky, Garri Mikhailovich; Elin, Ivan Ivanovich; Bykov, Valentin Mikhailovich; and Valchikhin, Dmitry Dmitrievich. Method and apparatus for thermal examination of the interior surface of annular stator packs for electrical machines. 3,886,362, Cl. 250-340.000.

Mitchell, John W., Sr.: *See—*
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Mitchell, Lester R. Silage spreader. 3,885,684, Cl. 214-17.0CB.

Mitchell, Maurice M., Jr., to Atlantic Richfield Company. Conversion of non-cyclic C_3–C_8 alkanes to aromatic hydrocarbons. 3,886,224, Cl. 260-673.000.

Mitchell, William Eric, to Dunlop Limited. Pneumatic tire wheel rim assembly. 3,885,615, Cl. 152-411.000.

Mitsubishi Chemical Industries, Ltd.: *See—*
Kikumoto, Ryoji; Ito, Masahiro; Nakamura, Akio; and Nomura, Tatsuo, 3,886,209.

Mitsubishi Denki Kabushiki Kaisha: *See—*
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Kurahashi, Koichiro; and Tottorik, Hiroshi, 3,886,404.
Miyamoto, Toshio; Wada, Yuichi; Hamano, Suenobu; Mori, Teijiro; Inoue, Takeo; and Shirasawa, Takashi, 3,886,511.
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Mitsui Toatsu Chemicals, Incorporated: *See—*
Asai, Kiyotsugu; Kawabata, Toshihiko; Sakai, Koichi; Fukuda, Kiyo; Nagahisa, Seiji; and Ichikawa, Toshiyuki, 3,886,226.

Miyahara, Junji, to Fuji Photo Film Co., Ltd. Photographic silver halide emulsion with silver halide grains having one twinning plane. 3,885,970, Cl. 96-94.00R.

Miyakawa, Seinan; and Shimoda, Mitsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electric camera shutter with voltage checking circuit. 3,886,443, Cl. 324-29.500.

Miyakawa, Seinan; and Tanaka, Hisao, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electric shutter controls for cameras. 3,886,571, Cl. 354-234.000.

Miyamoto, Toshio; Wada, Yuichi; Hamano, Suenobu; Mori, Teijiro; Inoue, Takeo; and Shirasawa, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Self-restoring current limiting device. 3,886,511, Cl. 337-119.000.

Mo Och Domsjo Aktiebolag: *See—*
Noreus, Sture Erik Olof, 3,886,034.

Mobil Oil Corporation: *See—*
Austin, Dennis R.; and McNease, Wilbern W., 3,886,418.
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Peiser, Alfred M.; and De Pasquale, Matthew J., 3,886,062.
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Moeller Mfg. Co., Inc.: *See—*
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Moertel, George B. Threadless slide fastener chains. 3,885,274, Cl. 24-205.16C.

Moertel, George B., to Textron Inc. Slide fastener and method and apparatus for making the same. 3,885,276, Cl. 24-205.16R.

Mohelnicky, Josef: *See—*
Zmatlik, Josef; Jisa, Miloslav; and Mohelnicky, Josef, 3,885,601.
Moisar, Erik; and Riester, Oskar, to Agfa-Gevaert Aktiengesellschaft. Supersensitized direct positive photographic silver salt emulsions. 3,885,972, Cl. 96-126.000.
Molins Machine Company, Inc.: *See—*
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Molnar, Jeno: *See—*
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Molzer, Peter: *See—*
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Monahan, Alan R., to Xerox Corporation. Light activating imaging process. 3,885,963, Cl. 96-33.000.
Monarch Marking Systems, Inc.: *See—*
Banks, Paul J., 3,885,334.
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Jenkins, William A., 3,885,497.
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Olin, John F., 3,885,952.
Unland, Mark Leroy, 3,886,260.
Montano, Joseph V., to Dresser Industries, Inc. Master link assembly. 3,885,445, Cl. 74-250.00R.
Montgomery, Howard W.; and Stanley, Charles R., to Boeing Company, The. Transportable loader for aircraft. 3,885,685, Cl. 214-38.0BB.
Moody, Harold W., Jr.; and Schaefer, Donald D., to Dunham-Bush, Inc. Optimized point of injection of liquid refrigerant in a helical screw rotary compressor for refrigeration use. 3,885,402, Cl. 62-505.000.
Moore, Gary Lee, to Owens-Illinois, Inc. Method of making a reinforced heat exchanger matrix. 3,885,942, Cl. 65-33.000.
Moore, Lionel G., Jr.; and Flynn, Thomas P., to Super Products Corporation. Dust filtration system. 3,885,932, Cl. 55-314.000.
Morenius, Bo Emil Fredrik: *See—*
Forslund, Erik Torsten; and Morenius, Bo Emil Fredrik, 3,885,610.
Moreno, Frederick E.: *See—*
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Morgan, Norman D., to Clemar Manufacturing Corporation. Timing unit for connecting power sequentially to a plurality of stations. 3,886,378, Cl. 307-141.400.
Mori, Hisataka: *See—*
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Morine, Richard L.; and Hokes, James J., to Fedco Inc. Guard assembly for endless flexible drive members. 3,885,471, Cl. 74-611.000.
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Morris, Edwin E., to General Electric Company. Automatic ranging in an active television system. 3,886,303, Cl. 178-6.000.
Morrison, Howard J.; and Nix, Donald F., to Marvin Glass & Associates. Balancing toy set. 3,885,342, Cl. 46-22.000.
Morrison, Wallace T., to Stoody Company. Variable flow-control valve. 3,885,769, Cl. 251-5.000.
Morrison, Wilbur J., to Bell and Howell Company. Gripper jaw insert mistake detector. 3,885,780, Cl. 270-56.000.
Mortensen, Jack G.; and Hurst, John L., to Tandy Corporation. Antenna swivel mount. 3,886,560, Cl. 343-882.000.
Morton-Norwich Products, Inc.: *See—*
Sipos, Frank; Pals, Donald T.; and Denning, George S., 3,886,134.
Morton, Roger R.: *See—*
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Moser, Karl: *See—*
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Mosko, Joseph A.; and Corzine, Robert G., to United States of America, Navy. Wideband, matched three port power divider. 3,886,498, Cl. 333-9.000.
Moss, James R.; and Wilson, Walter, to Bendix Corporation, The. Control device for rolled material feed. 3,885,747, Cl. 242-75.430.
Motoren-und Turbinen-Union Munich GmbH: *See—*
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Motorola, Inc.: *See—*
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Moyroud, Louis M.; and Bennett, Robert. Segmented disc for photocomposing machines. 3,886,566, Cl. 354-15.000.
MPL, Inc.: *See—*
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Mueller Co.: *See—*
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Muenchinger, Herman G., to Research Engineering & Manufacturing Inc. Torque-transmitting arrangement for fasteners and the like. 3,885,480, Cl. 81-121.00R.
Mukherjee, Dilip: *See—*
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Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pyroelectric element of polymer film. 3,885,301, Cl. 29-592.000.
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Nacci, George Raymond, to du Pont de Nemours, E. I., and Company. Photoimaging process using nitroso dimer. 3,885,964, Cl. 96-35.100.
Nafziger, Betty O. Closeable, disposable paperboard scoop. 3,885,266, Cl. 15-257.100.
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Naito, Motohiro, to Nihon Denshi Kabushiki Kaisha. Multiple ion beam type double focusing mass spectrometer. 3,886,357, Cl. 250-285.000.
Naito, Takayuki; Nakagawa, Susumu; and Abe, Yoshio, to Bristol-Myers Company. 4'-Deoxykanamycin A. 3,886,138, Cl. 260-210.00K.
Naito, Takayuki; Nakagawa, Susumu; and Abe, Yoshio, to Bristol-Myers Company. Derivatives of kanamycin. 3,886,139, Cl. 260-210.00K.

Najvar, Daniel J., to Dow Chemical Company, The. Low shrink water extended vinyl ester resin emulsion. 3,886,107, Cl. 260-29.6WQ.
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Neder, Gunter, to SKF Industrial Trading and Development Company, B.V. Connecting link for the races of ball bearings. 3,885,840, Cl. 308-184.00R.
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Nicolay, Hugh Crawford, to Harris Corporation. Isolated photodiode array. 3,886,587, Cl. 357-49.000.
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Niwa, Koichi, to Fuji Electric Co., Ltd. Method and apparatus for controlling multiple suspension cranes. 3,886,417, Cl. 318-7.000.
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Nordin, Elling Harald. Saliva extractor. 3,885,312, Cl. 32-33.000.
Nordin, Ivan C., to Parke, Davis & Company. Oxazolo [3,2-D]pyrazolo[4,3-F] [1,4]diazepin-6(7H)-one compounds. 3,886,143, Cl. 260-239.30T.
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Norris, Russel W. Ice machine control mechanism. 3,885,937, Cl. 62-137.000.

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Nutter, Dale E., to Heat/Fluid Engineering Corporation. Centrifugal apparatus for separating entrained liquids from a gaseous stream. 3,885,935, Cl. 55-457.000.

Oakes, Thomas Francis, to Bridgewater, Martin, a part interest. Architectural frames. 3,885,371, Cl. 52-475.000.

Oakley, Charles Burkhardt; and Schwarz, Hans George, to RCA Corporation. Control apparatus for a two-way cable television system. 3,886,454, Cl. 325-52.000.

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Obst, Karl-Heinz; Stradtmann, Jurgen; Metz, Paul; and Meyer, Francis, to Rheinische Kalksteinwerke GmbH; and Acieries Reunies de Burbach-Eich-Dudelange S.A., ARBED. Method and composition for the treatment of ferrous melts and process for making the treating composition. 3,885,956, Cl. 75-53.000.

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Ogihara, Masuo; and Watanabe, Masanori, to Seiko Koki Kabushiki Kaisha. Electromagnetic control device for electrically-operated shutter. 3,886,573, Cl. 354-258.000.

Ogle, James A., to Burroughs Corporation. Display panel. 3,886,389, Cl. 313-188.000.

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Ohnishi, Yasushi; and Tsukada, Masamichi, to Hitachi, Ltd. Spectro fluorescence and absorption measuring instrument. 3,886,363, Cl. 250-364.000.

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Ohtsuka, Minoru, to Canon Kabushiki Kaisha. Device for measuring displacement. 3,886,542, Cl. 340-347.0AD.

Ohtsuka, Yozo, to Sagami Chemical Research Center. Process for preparing imidazole-4,5-dicarboxamide. 3,886,176, Cl. 260-309.000.

Ohuchi, Hirobumi; Kamei, Tatsuya; Tsukuda, Kiyoshi; and Ogawa, Takuzo, to Hitachi, Ltd. Avalanche photodiode. 3,886,579, Cl. 357-13.000.

Ohuchi, Yasushi; Ebine, Toshiyuki; Ohwada, Takefumi; and Tomozaki, Ryozo, to Hitachi, Ltd. Stator core for rotary electric machines and method of manufacturing the same. 3,886,256, Cl. 310-216.000.

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Oka, Shunzo, to Matsushita Electric Industrial Co., Ltd. Variable Resistor. 3,886,514, Cl. 338-126.000.

Okabe, Katsuhiko, to Kabushiki Kaisha Koparu. Printing head feeding mechanism for printers. 3,885,661, Cl. 197-16.000.

Okada, Jujiro; and Satoo, Isamu. Method to produce an oval product having oval circumference by cutting process. 3,885,481, Cl. 82-1.00C.

Okada, Masayasu, to Hitachi, Ltd. Hydraulic machine control apparatus. 3,886,373, Cl. 290-52.000.

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Okano, Akira; Moritani, Yoichi; and Murakami, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Circuit for reproducing reference carrier wave. 3,886,462, Cl. 329-104.000.

O'Keefe, Robert F., to Automatic Switch Company. Tunable fluidic oscillator. 3,885,591, Cl. 137-826.000.

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Olsen, Daniel H., to Midland Insta-Change Company. Photo frame and the like. 3,885,336, Cl. 40-152.000.

Olstowski, Franciszek, to Dow Chemical Company, The. Rapid setting polyurethanes from diols and polyisocyanates prepared in the presence of a mixture of liquid modifiers. 3,886,102, Cl. 260-18.0TN.

Olstowski, Franciszek; and Parrish, Donald B., to Dow Chemical Company, The. Rapid setting nonelastomeric polyurethane compositions prepared in the peesence of an aromatic or partially hydrogenated aromatic compound. 3,886,182, Cl. 260-33.6UB.

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Omura, Morikazu; and Okuda, Masao, to Sawafuji Electric Company, Ltd. Electrical refrigerating compressor. 3,886,419, Cl. 318-132.000.

Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Shutter assembly having means for sequentially braking and stopping shutter blades. 3,886,572, Cl. 354-252.000.

O'Neal, Robert G.: *See*—
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O'Neil, William A.; and Ray, George H., to Amplifier Design And Service, Inc. Feed-forward amplifier system. 3,886,470, Cl. 330-149.000.

O'Neill, Gerald, to Raymond Lee Organization, Inc., The, a part interest. Toy parachute. 3,885,345, Cl. 46-86.00R.

Ono, Komei. Wrench. 3,885,479, Cl. 81-66.00R.

Ono, Masayuki, to Tanabe Seiyaku Co., Limited. Method for improvement of citrus fruits in quality. 3,885,949, Cl. 71-79.000.

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Ordonez, Carlos R., to Westinghouse Electric Corp. Refrigeration system with capacity control. 3,885,938, Cl. 62-196.000.

Orlowski, Friedrich-August: *See*—
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Osborne, John F.: *See*—
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Osenkina, Valentina Anatolievna; Khorolsky, Viktor Borisovich; and Ippolitov, Jury Sergeevich. Apparatus for carrying out continuous physical and chemical processes in fluidized bed of loose material. 3,885,917, Cl. 23-284.000.

Ostbergs Fabriks AG: *See*—
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Ostrowsky, Daniel; Jacques, Andre; and Papuchon, Michel, to Thomson-CSF. Holographic coupler for optical waveguides. 3,885,856, Cl. 350-3.500.

Ota, Hiroshi; and Matsuzaki, Tetsuo, to Toyoda-Koki Kabushiki Kaisha. Grinding machine. 3,885,353, Cl. 51-5.00D.

Otabe, Kisaburo: *See*—
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Over, William Roderick: *See*—
Long, Robert Alvin; Lucas, Joel William; Over, William Roderick; and Doty, Donald Sudson, 3,885,287.

Overbey, Charles A. Variable flushing control unit attachment for a toilet. 3,885,253, Cl. 4-67.00A.

Owaki, Kenichi; Umeda, Shozo; Furuta, Hiroshi; Hirose, Tadatsugu; and Shimuzi, Michihiro, to Fujitsu Limited. Brightness modulation system for a plasma display device. 3,886,403, Cl. 315-169.00R.

Owen, Hartley, to Mobil Oil Corporation. Method for catalytic cracking of residual oils. 3,886,060, Cl. 208-120.000.

Owen, Robert E. Hydraulically controlled door with tandem crank arms and latches. 3,885,349, Cl. 49-220.000.

Owens-Corning Fiberglas Corporation: *See*—
Gilbu, Agnar, 3,886,016.
Lokun, Terence M.; and Poulsen, Peder Ulrik, 3,886,338.
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Amberg, Stephen W.; Doherty, Thomas E.; and Heyne, Clarence A., 3,885,825.
Hinson, David C., 3,886,393.
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Pabreza, Robert M., to Excel Industries, Incorporated. Seat pedestal. 3,885,764, Cl. 248-162.000.

Pacemaker Diagnostic Clinic of American, Inc.: *See*—
Kennedy, James R., 3,885,552.

Pacific Metals Co., Ltd.: *See*—
Nagoya, Yoshishige; Takeuchi, Takashi; Murai, Kosuke; and Amano, Hirota, 3,885,908.

Pagel, Warren C., to Minnesota Mining and Manufacturing Company. Bonding film containing polytetramethyleneoxide elastomeric segments and polyepoxide. 3,886,189, Cl. 260-830.00R.

Paine, Rigaud B., Jr.; and Peshock, Michael, Jr., to Texas Instruments Incorporated. Aluminum retention maze and getter. 3,886,388, Cl. 313-177.000.

Palffy nee Oswald, Maria: *See*—
Huhn, Magda; Tardos, Laszlo; Somfai, Eva; Resofszki, Gabor; Kovacs nee Mindler, Vera; and Palffy nee Oswald, Maria, 3,886,279.

Pallos, Ferenc M.; and Menn, Julius J., to Stauffer Chemical Company. Insecticidal active geranyl and citronyl amine derivatives and their epoxides. 3,886,148, Cl. 260-240.00H.

Pals, Donald T.: *See*—
Sipos, Frank; Pals, Donald T.; and Denning, George S., 3,886,134.

Pamrod, Inc.: *See*—
Venable, Joseph M., 3,886,076.

Panteleev, German Borisovich. Installation for assembly of movable system of dynamic loudspeakers. 3,885,285, Cl. 29-203.00D.

Papalardo, William A. Peeling utensil. 3,885,307, Cl. 30-123.500.

Papuchon, Michel: *See*—
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Parallel Data Systems: *See*—
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Park, Kwang H., to General Motors Corporation. Piston ring groove for fluorocarbon seal rings. 3,885,460, Cl. 92-249.000.

Parke, Davis & Company: *See*—
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Nordin, Ivan C.; and Dewald, Horace A., 3,886,144.

Parker-Hannifin Corporation: *See*—
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Parker, James Brown; and Hicks, John Evan Philip, to Imperial Chemical Industries Limited. Manufacture of a smoking material. 3,885,575, Cl. 131-2.000.

Parker, Richard G.: *See*—
Byrne, Neil C.; Cullen, John R.; Parker, Richard G.; and Davis, Harry L., 3,885,260.

Parkhurst, Robert M.; and Stolzenberg, Sidney J., to Stanford Research Institute. Saponin-containing spermatocidal compositions. 3,886,272, Cl. 424-180.000.

Parks, Carl R., to Goodyear Tire & Rubber Company, The. Oxidation resistant polymeric compositions. 3,886,116, Cl. 260-45.85E.

Parliment, Thomas H.; Clinton, William P.; Scarpellino, Richard; Soukup, Robert J.; and Epstein, Martin F., to General Foods Corporation. Flavor compositions and processes. 3,886,297, Cl. 426-573.000.

Parr, Lee Roy. Pitching machine. 3,885,790, Cl. 273-26.00E.

Parrish, Donald B.: *See*—
Olstowski, Franciszek; and Parrish, Donald B., 3,886,182.

Parry, David W. Flexible tube winding and emptying device. 3,885,708, Cl. 222-100.000.

Parsons, John Henry, to Fisons Limited. 1-(Benzamido)pyridinium salts. 3,886,171, Cl. 260-295.00Q.

Pataky, Josef. Machining tool. 3,885,282, Cl. 29-98.000.

Patrick, Thomas R.: *See*—
Cheek, Tom F., Jr.; and Patrick, Thomas R., 3,886,359.

Patterson, Raymond B., III: *See*—
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Patton, Bobbie J.: *See*—
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Pearson, Peter Reginald, to National Research and Development Corporation. Electrode systems for gas discharge devices particularly gas lasers. 3,886,479, Cl. 331-94.50G.

Pecorella, Alessandro: *See*—
Fusaroli, Marzio; and Pecorella, Alessandro, 3,885,999.

Pedroso, Raul Ismael, to North American Philips Corporation. Artificial heart pump or assist. 3,885,251, Cl. 3-1.000.

Peiser, Alfred M.; and De Pasquale, Matthew J., to Mobil Oil Corporation. Method and apparatus for fractionating multi-component feeds. 3,886,062, Cl. 208-354.000.

Peltier, Richard I. Device for providing fluid communication between two sealed vessels. 3,885,607, Cl. 141-329.000.

Pendergast, Daniel O.; Engel, William T.; and Dorrough, Vernon R., to Jet Research Center. Aircraft emergency egress system. 3,885,761, Cl. 244-121.000.

Pengilly, Eric Alexander. Gearing-torque division. 3,885,446, Cl. 74-331.000.

Penhallurick, Mervyn Major; and McGrath, Colin, to Penmac Distributors. Apparatus for slicing and spreading bread. 3,885,463, Cl. 99-450.200.

Penmac Distributors: *See*—
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Pennwalt Corporation: *See*—
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Peres, Anthony R., to Peres Electronic Machines, Inc. Automatic random case sealer. 3,885,372, Cl. 53-75.000.

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Permtek, Incorporated: *See*—
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Peschel, Stanley G., to Hipotronics, Inc. Flexible snake-like string of components encased in tubular sheath immersed in oil. 3,886,412, Cl. 317-99.000.

Peshock, Michael, Jr.: *See*—
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Petaja, Danny A. Level compensated frequency selector. 3,886,457, Cl. 325-399.000.

Peter, Harley D.: *See*—
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Petermann, James P.; Dolinar, William E.; and Ehrlich, Stanley V., to Georgia-Pacific Corporation. Machine for manufacturing articles of folded plasterboard. 3,885,725, Cl. 227-66.000.

Peters, Philip H., Jr., to Environment/One Corporation. Induction cooking unit having all pan safe operation, wide range power control and low start-up and shut-down transients. 3,886,342, Cl. 219-10.490.

Petigara, Ramesh B.: *See*—
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Petinaux, Marcel; Metzger, Jacques; Aune, Jean-Pierre; and Knoche, Hubert, to Entreprise de Recherches et d'Activities Petrolieres ELF. Method of preparation of indole. 3,886,178, Cl. 260-319.100.

Petit, Jorge E.; Enns, Mark K.; and Carlson, Norman R., to Westinghouse Electric Corporation. Application of basecase results to initiate iterations and test for convergence in a hybride computer arrangement used to generate rapid electric power system loadflow solutions. 3,886,332, Cl. 235-151.210.

Petranek, Milan: *See*—
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Petreev, Anatoly Mikhailovich: *See*—
Goppen, Albert Adolfovich; Nikolaev, Igor Vladimirovich; Vysotsky, Iosif Fadeevich; Zaslavsky, Mikhail Maximovich; Klushin, Nikolai Alexandrovich; Petreev, Anatoly Mikhailovich; Dronova, Lidia Mikhailovna; Lednikov, Anatoly Ivanovich; Grishenkov, Jury Alexandrovich; and Bashlykov, Jury Mikhailovich, 3,885,634.

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Pfeiffer, Peter W., to Hamilton, Colleen B. Starting device for an internal combustion engine. 3,885,544, Cl. 123-179.05E.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Acridone carboxylic acids and derivatives. 3,886,162, Cl. 260-279.00R.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Disubstituted xanthone carboxylic acid compounds. 3,886,181, Cl. 260-335.000.

Pfizer Inc.: *See—*
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Philbrook, James E.; and Thunberg, Jon C., to W. R. Grace & Co. Process for preparing iminodiacetonitrile. 3,886,198, Cl. 260-465.50A.

Philco-Ford Corporation: *See—*
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Philibert, Robert A., to General Signal Corporation. Expansion fitting. 3,885,821, Cl. 285-175.000.

Phillips Petroleum Company: *See—*
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Carter, Cecil O., 3,886,220.
Cobb, Raymond L., 3,886,196.

Piccone, Dante E.; and Somos, Istvan, to General Electric Company. Overvoltage protective circuit for high power thyristors. 3,886,432, Cl. 321-11.000.

Pike, Albert. Rotary engine. 3,885,532, Cl. 123-43.00B.

Pilato, Joseph Michael; Magee, John Storey, Jr.; and Albers, Edwin Wolf, to W. R. Grace & Co. Preparation of hydrocarbon conversion catalysts. 3,886,094, Cl. 252-451.000.

Pillard, Marcel T. Residual gas burner with superimposed, increasing size burning chambers. 3,885,919, Cl. 23-277.00C.

Pilot Chemicals, Inc.: *See—*
Hyman, Mark, Jr., 3,886,082.

Pinsley, Edward A., to United Aircraft Corporation. Closed cycle gas dynamic laser. 3,886,475, Cl. 331-94.50P.

Pioneer Arts & Crafts, Inc.: *See—*
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Pitcher, Robert Hazell, to Automotive Products Co., Ltd. Vehicle suspension. 3,885,809, Cl. 280-112.00A.

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Pitt, Leland S.: *See—*
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Pivawer, Philip M., to Olin Corporation. Process for preparing tris (2-haloalkyl) phosphites. 3,886,239, Cl. 260-977.000.

Place, Osmund V.; Hungerford, Philip C., Jr.; and Gereby, John L., to Cardpak Incorporated. Apparatus for securing articles to a display board. 3,885,373, Cl. 53-196.000.

Pladys, Nestor Leon, to British Petroleum Company Limited, The. Floating roof. 3,885,699, Cl. 220-225.000.

Plantard, Dominique: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 3,885,940.

Playart Limited: *See—*
Tong, Duncan, 3,885,344.

Pogonowski, Ivo C., to Texaco Inc. Method of sealing two telescopic pipes together. 3,885,298, Cl. 29-507.000.

Polak, Leo F.; and Kalensher, Bernard E., to Xerox Corporation. Generation of curved surfaces on a workpiece. 3,885,923, Cl. 51-33.00W.

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Polaroid Corporation: *See—*
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Pollock, Gordon J. Modular noise abatement enclosure and joint seal. 3,885,362, Cl. 52-122.000.

Polselli, Luigi; and Polselli, Rudolph T. Curb marking gage. 3,885,315, Cl. 33-42.000.

Polselli, Rudolph T.: *See—*
Polselli, Luigi; and Polselli, Rudolph T., 3,885,315.

Polyak, Samuil Moiseevich: *See—*
Shubin, Vladimir Nikolaevich; Polyak, Samuil Moiseevich; and Silantiev, Viktor Sergeevich, 3,885,475.

Polymer Films Inc.: *See—*
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Pori, John R., to Parallel Data Systems. No hands voice instruction for EEG telemetering system. 3,886,314, Cl. 179-2.0DP.

Porter, Virgle E., to Sippican Corporation, The. Solid-state gating circuit for cross-point switching. 3,886,369, Cl. 250-551.000.

Post Office, The: *See—*
Lund, Alfred Ernest; and Holbrook, Kenneth Harry, 3,885,309.
Rollett, John Mortimer; and Wise, David Richard, 3,886,469.

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Poulsen, Peder Ulrik, to Owens-Corning Fiberglas Corporation. Method and apparatus for the continuous production of fiber reinforced plastic pipes of variable wall thickness. 3,886,029, Cl. 156-429.000.

Poulsen, Peder Ulrik: *See—*
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Powell, James B.; Yeiser, Beverly G.; and Lightner, Joseph R. Apparatus and method for transporting, unloading and processing live poultry. 3,885,525, Cl. 119-17.000.

PPG Industries, Inc.: *See—*
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Production Engineering Research Association of Great Britain, The: *See—*
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Prosser, David G., to Autotrol Corporation. Air driven rotating biological contactor apparatus. 3,886,074, Cl. 210-150.000.

Puchalski, Walter J., to United States of America, Army. Projectile containing pyrotechnic composition for reducing base drag thereof. 3,886,009, Cl. 149-43.000.

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Putney, David H., to Stratford Engineering Corporation. Classifying centrifugal separator. 3,885,933, Cl. 55-397.000.

Quadracast Systems, Inc.: *See—*
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Quintiliani, Saverio Michael; Finkel, Alan Grad; Smith, Harry Richard; Damiano, Peter Anthony, Jr.; and Spranger, Douglas Michael, to International Telephone and Telegraph Corporation. Card-programmed frequency control unit for a transceiver. 3,886,453, Cl. 325-25.000.

R. T. Vanderbilt Company, Inc.: *See—*
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Rasmussen, Keith O. Close-coupled articulating headrest. 3,885,831, Cl. 297-410.000.

Raue, Roderich: *See—*
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Ray, Neil Hunter; and Laycock, John Nicolas, to Imperial Chemical Industries Limited. Li_2O-ZnO-P_2O_5-glass. 3,885,973, Cl. 106-47.00R.

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Reed, Samuel F., Jr., to United States of America, Army. Carboxy-terminated butadiene-vinyl ferrocene copolymers. 3,886,190, Cl. 260-439.0CY.
Reed, Samuel F., Jr., to United States of America, Army. Carboxy-terminated copolymers of isoprene and vinyl ferrocene. 3,886,191, Cl. 260-439.0CY.
Reed, Samuel F., Jr., to United States of America, Army. Carboxy-terminated copolymers of chloroprene and vinyl ferrocene. 3,886,192, Cl. 260-439.0CY.
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Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Loop shaped circuit test point. 3,885,854, Cl. 339-218.00M.
Reindl, Klaus, to Siemens Aktiengesellschaft. Method for the simultaneous formation of semiconductor components with individually tailored isolation regions. 3,885,998, Cl. 148-175.000.
Reiners, Wolfgang, to G. Siempelkamp & Co. Continuous prepress for fiberboard plant. 3,885,901, Cl. 425-371.000.
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Rice, Eldon E.; and Lantero, Oreste J., Jr., to Swift and Company. Cheese manufacture using highly active proteolytic enzymes. 3,886,288, Cl. 426-36.000.
Richards, Adrian John. Furniture frames. 3,885,765, Cl. 248-188.100.
Richards, Elmer A.: *See—*
Braun, Eugene R.; and Richards, Elmer A., 3,885,447.
Richardson Chemical Company: *See—*
Duchene, Joseph R.; and De Christopher, Philip J., 3,886,054.
Richardson, Edwin A., to Shell Oil Company. Buffer-regulated carbonate acidization. 3,885,630, Cl. 166-307.000.
Richitelli, Charles G.: *See—*
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Richter, Helmut; Forster, Eckehard; Spetzler, Edgar; Wendorff, Jochen; and Rommerswinkel, Heinrich-Wilhelm, to Thyssen Niederrhein AG Hutten-und -Walzwerke. Method for the desulfurization of a steel melt. 3,885,957, Cl. 75-58.000.
Richter, Sidney B.: *See—*
Levin, Alfred A.; and Richter, Sidney B., 3,886,194.
Richter, Werner, to Motoren-und Turbinen-Union Munich GmbH. Unshrouded internally cooled turbine blades. 3,885,886, Cl. 415-116.000.
Ricoh Co., Ltd.: *See—*
Kato, Saburo; Sue, Takaji; and Itoh, Tadanao, 3,886,592.
Riedel, Dieter, to Drabert Sohne. Method for the continuous decatizing of fabrics. 3,885,262, Cl. 8-149.300.
Riester, Oskar: *See—*
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Riggs, Robert R.: *See—*
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Rio, Arturo; Cerrone, Marcello; and Saini, Alberto, to Societa' Italiana per Azioni per la Produzione di Calci e Cementi di Segni. Cement products. 3,885,979, Cl. 106-89.000.
Riseman, Jacob, to International Business Machines Corporation. Ferrite head. 3,886,025, Cl. 156-325.000.
Rizzo, Robert. Centrifugal bicycle wheel. 3,885,814, Cl. 280-217.000.
Robert Bosch G.m.b.H.: *See—*
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Kaiser, Anton; Keller, Helmut; and Kugelmann, Adolf, 3,885,304.
Staudt, Heinrich; Hofmann, Eberhard; Eckell, Wolfgang; and Knorreck, Peter, 3,885,895.
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Roberts, Joseph P.: *See—*
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Robertson, Jerry D., to Camp Trails Company. Pack frame suspension means. 3,885,722, Cl. 224-25.00A.
Robinson, Madeleine O.; and Burton, Paul F. Educational method and apparatus. 3,885,326, Cl. 35-35.00J.
Rockwell, Adelbert W., Jr., to USM Corporation. Apparatus for generating pulses of fluid pressure. 3,885,554, Cl. 128-24.00R.
Rockwell, Bruce C., to Dana Corporation. Compression molding apparatus. 3,885,909, Cl. 432-122.000.
Rockwell International Corporation: *See—*
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Watson, George A.; and Bollinger, John J., 3,886,541.
Rockwood, Inc.: *See—*
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Rodgers, Douglas N.: *See—*
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Rodgers, James L.; and Tyrrell, Joseph L., to Talos Systems, Inc. Electrical writing pen and sensor. 3,886,311, Cl. 178-18.000.
Rogers, John E., to Evans, Ronald J. P. Pressure controlled resilient supporting structure. 3,885,257, Cl. 5-345.00R.

Rohatgi, Pradeep Kumar: *See*—
Badia, Frank Arthur; and Rohatgi, Pradeep Kumar, 3,885,959.

Rohr Industries, Inc.: *See*—
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Roland Offsetmaschinenfabrik Faber & Schleicher: *See*—
Breitweg, Peter; Franz, Karl-Heinz; Mayer, Peter; and Wolf, Klaus, 3,885,496.

Rollband, Ernest J. Plummet. 3,885,319, Cl. 33-392.000.

Rollett, John Mortimer; and Wise, David Richard, to Post Office, The. Filter Networks. 3,886,469, Cl. 330-107.000.

Rollins, Jack D.; Best, Ralph E.; Riggs, Robert R.; Anderson, Clifford J.; and Barnhart, Victor J., to Nuclear Fuel Services, Inc. Spent fuel shipping cask. 3,886,368, Cl. 250-507.000.

Romanov, Vasily Vasilievich: *See*—
Miroshnikov, Mikhail Mikhailovich; Mineev, Evgeny Nikolaevich; Karapetian, Konrad Saakovich; Ivanova, Roza Nikolaevna; Romanov, Vasily Vasilievich; Kurnakov, Sergei Nikolaevich; Khutoretsky, Garri Mikhailovich; Elin, Ivan Ivanovich; Bykov, Valentin Mikhailovich; and Valchikhin, Dmitry Dmitrievich, 3,886,362.

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Rosenberg, Thomas; and Rosenberg, Harold. Anti-theft security chain. 3,885,674, Cl. 211-4.000.

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Roslonski, Donald Joseph: *See*—
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Ross, James A.; and Houdyshel, James A., to Rohr Industries, Inc. Compressed back iron linear motor laminated core. 3,886,383, Cl. 310-12.000.

Ross, John R. Gastrointestinal aspirator pump. 3,885,567, Cl. 128-278.000.

Ross, Ronald Jay: *See*—
Sherman, John Delano; and Ross, Ronald Jay, 3,885,927.

Rossfelder, Andre, to Le Nickel; Centre National Pour L'Exploitation Des Oceans; and Tetra Tech Incorporated, part interest to each. Free-grab device for collecting underwater samples. 3,885,440, Cl. 73-425.200.

Rous, Arthur, deceased (by Rous, Vivian); Cowen, David; and Eisenstein, Myron, to Stone Container Corporation. Book carton. 3,885,729, Cl. 229-40.000.

Rous, Vivian: *See*—
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Rowland, Kenneth Harry, to Avon Rubber Company Limited. Making reinforced fabrics. 3,885,604, Cl. 140-3.00C.

Roy, Prodyot; and Rodgers, Douglas N., to United States of America, Energy Research and Development Administration. Hydrogen detector for sodium cooled reactors. 3,886,444, Cl. 324-33.000.

Royal, Douglas E., to TRW Inc. Radiating target direction finding system. 3,886,555, Cl. 343-117.000.

Royster Company: *See*—
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Rubel, George K. E. Artist humidifier for palette displayed paints and values. 3,885,843, Cl. 312-31.000.

Rubinshtein, Georgy Nesanelovich: *See*—
Shurygin, Alexei Petrovich; Bernadiner, Mikhail Naumovich; Esilevich, Boris Semenovich; Rubinshtein, Georgy Nesanelovich; Shipov, Emanuil Ivanovich; Gubarev, Viktor Georgievich; Lepakhin, Igor Alexandrovich; Tripushkin, Rudolf Rudolfovich; Sharov, Petr Mikhailovich; Lurie, Boris Isaevich; Vodnev, Arkady Dmitrievich; Moshkovich, Alexandr Bentsionovich; Lupanov, Pavel Alexandrovich; Lukoshkin, Viktor Leonidovich, deceased; and Lukoshkina, Tatyana Dmitrievane, administrator, 3,885,906.

Ruby, Lowell E.; Witt, Donald L.; and Staley, Charles F., to United Aircraft Corporation. Closed cycle device. 3,886,477, Cl. 331-94.50G.

Rucker Company, The: *See*—
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Ruf, Max, to Audi NSU Auto Union Aktiengesellschaft. Liquid cooled housing for rotary piston combustion engine. 3,885,896, Cl. 418-83.000.

Rufenacht, Kurt: *See*—
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Ruhrchemie Aktiengesellschaft: *See*—
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S. A. Manufacture d'Armes et Cycles de Chatellerault: *See*—
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Sachs, Charlotte Cramer. Personal cooling device. 3,885,571, Cl. 128-400.000.

Sadamitsu, Kazuo: *See*—
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Ohtake, Toshikazu; Taniguchi, Koichi; Sakurai, Yasuhiko; Higo, Nobumasa; and Ohta, Jun, 3,886,517.

Salsby, Burton A. Hunting vest. 3,885,248, Cl. 2-94.000.

Samokhvalov, Mark Markovich: *See*—
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Sanders, James Milton; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Foodstuffs containing 2-(4-hydroxy-4-methylpentyl) norbornadiene. 3,886,289, Cl. 426-538.000.

Sanders, John Edward. Grandstands. 3,885,827, Cl. 296-64.000.

Sandhu, Jagtar S.: *See*—
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Sandoz, Inc.: *See*—
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Sandvik Aktiebolag: *See*—
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Sanglert, Benkt, to Saab-Scania Aktiebolag. Producing signals denoting location of edges of a finished surface on a partly finished workpiece. 3,886,372, Cl. 250-571.000.

Sankyo Company Limited: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Horiuchi, Hideo; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,886,115.

Santilli, Arthur A., to American Home Products Corporation. Esters of 6-(substituted)-5,6,7,8-tetra-hydro-8-ethyl-5-oxo-2-(methylthio)pyrido[2,3-d]pyrimidine-6-carboxylic acids. 3,886,159, Cl. 260-256.500.

Sarantakis, Dimitrios: *See*—
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Sarno International Speedways, Inc.: *See*—
Sarno, Jay; Daugherty, Jon; and Schneidinger, Carl, 3,885,502.

Sarno, Jay; Daugherty, Jon; and Schneidinger, Carl, to Sarno International Speedways, Inc. Entertainment vehicle ride. 3,885,502, Cl. 104-53.000.

Sasada, Katsumi: *See*—
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Sasaki, Fumi, to Kenju Sangyo Kabushiki Kaisha. Electronic musical instrument having keyboards. 3,885,489, Cl. 84-1.010.

Sashihara, Kenji; Masuda, Takao; Noguchi, Yasuhiro; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Thermally developable light-sensitive element. 3,885,967, Cl. 96-67.000.

Satchell, Fred E., to Sherwood Medical Industries, Inc. Suction drainage control connector. 3,885.565, Cl. 128-276.000.

Sato, Hisaharu. Friction clutch. 3,885,657, Cl. 192-79.000.

Sato, Masaaki, to Olympus Optical Co., Ltd. Device for automatically interchanging tape cassettes in a tape recorder. 3,886,593, Cl. 360-92.000.

Sato, Masatoshi: *See*—
Masuzawa, Isao; Kawada, Shin-ichi; Hirokawa, Yoichi; and Sato, Masatoshi, 3,886,422.
Masuzawa, Isao; Kawada, Shin-ichi; Hirokawa, Yoichi; and Sato, Masatoshi, 3,886,423.

Sato, Tadashi: *See*—
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Sato, Taiji: *See*—
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Saueressig GmbH: *See*—
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Saueressig, Johann Heinrich, to Saueressig GmbH. Print machine and method. 3,885,494, Cl. 101-181.000.

Saunders, Rhoderick K.: *See*—
Gale, Walter W.; Ashcraft, Thomas L., Jr.; and Saunders, Rhoderick K., 3,885,626.

Sausen, George N., to du Pont de Nemours, E. I., and Company. Organic nitrogen-fluorine compounds and their preparation. 3,886,197, Cl. 260-465.50R.

Sautton, Guy, to Thomson-CSF. Document singling arrangement. 3,885,784, Cl. 271-94.000.

Savory, Frederick Ralph, to Steel Construction & Engineering Co. (Notts.) Limited. Hydraulically operated guillotine. 3,885,485, Cl. 83-625.000.

Sawada, Yoshihiro: *See*—
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Sawafuji Electric Company, Ltd.: *See*—
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Scannell, John B., to Parker-Hannifin Corporation. Packing. 3,885,801, Cl. 277-165.000.

Scarpellino, Richard: *See*—
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Scarpino, Leopoldo, to AMAX Inc. Means for monitoring the safety of a remote electrical ground connection. 3,886,409, Cl. 317-18.00C.

Schaar, Charles H. Expandable article. 3,885,568, Cl. 128-287.000.

Schaefer, Donald D.: *See*—
Moody, Harold W., Jr.; and Schaefer, Donald D., 3,885,402.

Schaefer, John O., to International Business Machines Corporation. Steerable follower selection mechanism. 3,885,662, Cl. 197-52.000.

Schaefer, Robert Bey, to Pennwalt Corporation. Snap-on safety closure for containers. 3,885,695, Cl. 215-224.000.

Schaller, Robin E., to Donaldson Company, Inc. Vortex forming apparatus and method. 3,885,931, Cl. 55-261.000.

Scharf, Edward Jonathan: *See*—
Kemme, Herbert Rudolph Conrad; and Scharf, Edward Jonathan, 3,886,223.

Scharnetzke, Horst: *See*—
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Scheben, Hans, to Stabilus GmbH. Lifting mechanism for the window of a vehicle. 3,885,350, Cl. 49-348.000.

Scheepsbouwbelangen B.V.: *See*—
Wipkink, Johannes; Van Holst, Marinus; and Wolters, Johan Gerhard, 3,885,511.

Scheerer, Carl C. Apparatus for removing air-in-excess-of-saturation from water samples to be measured. 3,885,930, Cl. 55-196.000.

Schell, Friedrich Peter, to Revolution, Inc. Material shaping platform with multiple or exchangeable templates. 3,885,611, Cl. 144-145.00R.

Schell, Friedrich Peter, to Revolution, Inc. Material shaping platform with multiple or exchangeable templates. 3,885,612, Cl. 144-145.00R.

Schertel, Hanns Von; and Munch, Otto, to Supramar AG. Automatic mechanism for preventing cavitation at air fed hydrofoils and flow bodies. 3,885,513, Cl. 114-66.50H.

Schierer, Joseph Philip, Jr., to Tektronix, Inc. Electronic scanning spectrophotometer system. 3,886,331, Cl. 235-151.300.

Schiller, Barry. Releasable loop belt. 3,885,250, Cl. 2-321.000.

Schlenker, Larry D., to United States of America, Energy Research and Development Administration. Nuclear fuel pin controlled failure device. 3,886,037, Cl. 176-68.000.

Schliebs, Reinhard: *See*—
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Geffers, Hans; Radt, Walter; Schulz, Hartmut; and Schliebs, Reinhard, 3,886,205.

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Schmaldienst, Peter: *See*—
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Schmalzbauer, Herbert F., to Xerox Corporation. Stripper finger. 3,885,786, Cl. 271-174.000.

Schmermund, Alfred. Device for use in folding a sheet of packaging material. 3,885,374, Cl. 53-234.000.

Schmidt, Robert Rudolf: *See*—
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Schmook, Fritz-Peter: *See*—
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Schneider, Clayton J., Jr., to Calspan Corporation. Fail-safe electrical timer. 3,885,501, Cl. 102-70.20R.

Schneider, Walter. Bathroom cabinet, especially for hospitals. 3,885,844, Cl. 312-227.000.

Schneidinger, Carl: *See*—
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Schonbeck, Rupert: *See*—
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Schreiner, Louis W., to Warwick Electronics Inc. Flyback transformer. 3,886,434, Cl. 321-27.00R.

Schrempp, Jean: *See*—
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Schrotz, William Frederick: *See*—
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Schubeck, Phillip A., to Ford Motor Company. Carburetor cold enrichment control. 3,886,241, Cl. 261-39.00B.

Schubert, Walter; Wendt, Harry; and Doss, Reiner. Device for measuring semiconductor radiation sources. 3,886,370, Cl. 250-552.000.

Schucker, Gerald D.; Sugarvara, Ken F.; and Weetoll, Howard H., to Corning Glass Works. Chelating agents coupled to inorganic carriers and method of preparing. 3,886,080, Cl. 252-176.000.

Schuermann, Fritz; Muller, Herbert; Boddicker, Horst; and Heusinger, Peter-Paul, to Bergwerksverband GmbH. Method of measuring changes in the area surrounding a mining cavity. 3,885,423, Cl. 73-88.00E.

Schuh, Eduard: *See*—
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Schuhmacher, Alfred; and Schwantje, Gerd, to BASF Aktiengesellschaft. Production of pure 1-amino-4-nitroanthraquinone-2-carboxylic acid. 3,886,188, Cl. 260-376.000.

Schultz, Edward G., Jr.: *See*—
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Schultz, Hartmut: *See*—
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Schulz, Hartmut: *See*—
Geffers, Hans; Radt, Walter; Schulz, Hartmut; and Schliebs, Reinhard, 3,886,205.

Schuster, Friedrich, to Kugelfischer Georg Schafer & Co. False twisting apparatus. 3,885,378, Cl. 57-77.450.

Schutz, Richard Adrien; and Exbrayat, Pierre Elisee. Apparatus for sizing textile fibres. 3,885,277, Cl. 28-1.00R.

Schutze, Henry G.; and Wilder, Hulen L., to Exxon Research and Engineering Company. Polyolefin composition and use of same in alkaline solutions. 3,886,105, Cl. 260-23.00H.

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Dorschner, Kenneth P.; and Albright, James A., 3,885,954.

Scott, Howard Mulder; and Schrotz, William Frederick, to Information International Inc. Phototypesetting system. 3,886,304, Cl. 178-6.70R.

Scott, Keith Taylor: *See*—
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Scott USA: *See*—
French, Charles S., 3,885,329.

Seaquist Valve Company: *See*—
Ewald, Ronald F., 3,885,717.

Sebastiani, Ben A. Adjustable stand for electronic calculators or the like. 3,885,762, Cl. 248-13.000.

Seer, Harold George, Jr., to RCA Corporation. Short circuit protection apparatus for a regulated power supply. 3,886,410, Cl. 317-31.000.

Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Linear electromagnetic systems. 3,886,452, Cl. 325-11.000.

Seidler, Helmut G.; and Walker, James T., to Philco-Ford Corporation. Variable gain vehicle speed control system. 3,885,644, Cl. 180-105.00E.

Seiko Koki Kabushiki Kaisha: *See*—
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Onda, Eiichi; Koyama, Mitsuo; and Nakagawa, Tadashi, 3,886,572.

Seismograph Service Corporation: *See*—
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Sekiguchi, Hideo; and Sadamitsu, Kazuo, to Furukawa Electric Co., Ltd., The. Method for forming polyoxadiazole series resin solution into shaped articles. 3,886,251, Cl. 264-184.000.

Seko, Tsuyoshi: *See—*
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Selas Corporation of America: *See—*
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Selden, Wilson C.: *See—*
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Selenia-Industrie Elettroniche Associate S.p.A.: *See—*
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Sellstedt, John H.; Teller, Daniel M.; and Guinosso, Charles J., to American Home Products Corporation. 4-Oxo-5-thiazolinyl(thiazinyl)acetamido-cephalosporanic. 3,886,150, Cl. 260-243.00C.

Selmeczi, Joseph G.; and Vlnaty, Joseph, to Dravo Corporation. Desulfurization of coal. 3,886,048, Cl. 201-17.000.

Selonke, Fritz: *See—*
Bornfleth, Ulrich; Selonke, Fritz; and Scharnetzke, Horst, 3,885,683.

Seppic: *See—*
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Serafin, Frank G.; Previte, Robert W.; and Stierli, Robert F., to W. R. Grace & Co. Additive for improving hydraulic cement compositions. 3,885,985, Cl. 106-315.000.

Serafin, John: *See—*
Ford, John L.; and Serafin, John, 3,885,590.

Serefor Industries, Inc.: *See—*
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Sexton, James H.; and Patton, Bobbie J., to Mobil Oil Corporation. Uphole receiver for logging-while-drilling system. 3,886,495, Cl. 340-18.0LD.

Seymour, James E., to Royster Company. Process for reducing the concentration of fertilizer particulates in exhaust stack gases. 3,885,946, Cl. 71-30.000.

Shaffer, Leon L.: *See—*
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Shank, Herbert C., Jr., to Anchor Hocking Corporation. Method of applying decals to surfaces of complex curvature. 3,886,020, Cl. 156-211.000.

Sharov, Petr Mikhailovich: *See—*
Shurygin, Alexei Petrovich; Bernadiner, Mikhail Naumovich; Esilevich, Boris Semenovich; Rubinshtein, Georgy Nesanelovich; Shipov, Emanuil Ivanovich; Gubarev, Viktor Georgievich; Lepakhin, Igor Alexandrovich; Tripushkin, Rudolf Rudolfovich; Sharov, Petr Mikhailovich; Lurie, Boris Isaevich; Vodnev, Arkady Dmitrievich; Moshkovich, Alexandr Bentsionovich; Lupanov, Pavel Alexandrovich; Lukoshkin, Viktor Leonidovich, deceased; and Lukoshkina, Tatyana Dmitrievane, administrator, 3,885,906.

Sharp, Allen B.; and Hull, Richard A., to Al-jon Incorporated. Method and apparatus for cutting mounted tires from the wheels of junked vehicles. 3,885,292, Cl. 29-403.000.

Shelfmaker Products Corporation: *See—*
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Shell Oil Company: *See—*
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Watkins, Bruce J.; and Johnson, Glenn D., 3,885,623.

Shepard, Clayton Leon. Folding chair. 3,885,828, Cl. 297-52.000.

Sherman, John Delano; and Ross, Ronald Jay, to Union Carbide Corporation. Process for removing carbon dioxide from gas streams. 3,885,927, Cl. 55-68.000.

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Shinada, Shinichi: *See—*
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Shindo, Akio; Nakanishi, Yoichiro; and Sawada, Yoshihiro, to Agency of Industrial Science & Technology. Method for manufacture of heat-resistant fibers. 3,886,263, Cl. 423-447.000.

Shioya, Kazuhisa, to Tatibana Works, Limited; and Diichi Seiyaku Company, Limited. Automatic continuous container inspecting method and apparatus. 3,886,353, Cl. 250-223.00B.

Shipov, Emanuil Ivanovich: *See—*
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Doi, Kazuo; Nakajima, Jun; Shodai, Masahiko; Uchimura, Junichi; Wada, Takeaki; and Shibata, Zenzaburo, 3,885,978.

Shook, Alvin L. Wrench for removing automobile radiator caps. 3,885,477, Cl. 81-3.10R.

Shotmeyer, Albert. Device for removing water from the bottom of underground liquid fuel tanks. 3,885,588, Cl. 137-565.000.

Showa Denka Kabushiki Kaisha: *See—*
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Shubin, Vladimir Nikolaevich; Polyak, Samuil Moiseevich; and Silantiev, Viktor Sergeevich. Program control apparatus. 3,885,475, Cl. 74-568.00R.

Shurygin, Alexei Petrovich; Bernadiner, Mikhail Naumovich; Esilevich, Boris Semenovich; Rubinshtein, Georgy Nesanelovich; Shipov, Emanuil Ivanovich; Gubarev, Viktor Georgievich; Lepakhin, Igor Alexandrovich; Tripushkin, Rudolf Rudolfovich; Sharov, Petr Mikhailovich; Lurie, Boris Isaevich; Vodnev, Arkady Dmitrievich; Moshkovich, Alexandr Bentsionovich; Lupanov, Pavel Alexandrovich; Lukoshkin, Viktor Leonidovich, deceased; and by Lukoshkina, Tatyana Dmitrievane, administrator. Cyclone furnace. 3,885,906, Cl. 431-173.000.

Shvartsman, Vadim Lvovich: *See—*
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Sidoti, Joseph E., to Electronic Associates, Inc. Flight simulator. 3,885,325, Cl. 35-12.00F.

Siebring, Barton G., to Oppenhuizen, Simon M. Power lifting attachment for vehicles. 3,885,686, Cl. 214-77.00R.

Siegel, Hardo: *See—*
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Siegl, Herbert: *See—*
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Sieke, Rainer: *See—*
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Sigma-Tau Industrie Farmaceutiche/Riunite S.p.A.: *See—*
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Silantiev, Viktor Sergeevich: *See—*
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Simington, Garnet J. Air drive adaptor. 3,885,387, Cl. 60-370.000.

Simpson, Malcolm Patrick; and Stockwell, Claude Lewis, to United Kingdom Atomic Energy Authority. Method of producing gel spheres and gelation apparatus. 3,886,086, Cl. 252-317.000.

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Sipos, Frank; Pals, Donald T.; and Denning, George S., to Morton-Norwich Products, Inc. Analogues of angiotensin II. 3,886,134, Cl. 260-112.500.

Sippican Corporation, The: *See—*
Porter, Virgle E., 3,886,369.

Sirk, Walter Ulo; and Street, Douglas Brian, to Production Engineering Research Association of Great Britain, The. Counting system. 3,886,375, Cl. 307-112.000.

Sjostrand, Evert, to ITT Industries, Inc. System for coupling pump units to outlets under water. 3,885,714, Cl. 222-180.000.

Skacel, Stephen J., to Waldmann-Verpackung KG. Winding device for winding rolls of strips or ribbons. 3,885,749, Cl. 242-56.00A.

SKF Industrial Trading and Development Company, B.V.: *See—*
Ernst, Horst; Brandenstein, Manfred; and Olschewski, Armin, 3,885,658.
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SKF Kugellagerfabriken GmbH: *See—*
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Skidmore, Sam C. Combination rotary and percussion drill bit. 3,885,638, Cl. 175-390.000.

Skora, Robert F.: *See—*
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Skrobisch, Alfred, to Staver Company, Incorporated, The. Segmental readout device having improved magnetic circuit components. 3,886,545, Cl. 340-373.000.

Skvarenina, John. Pipe cutting tool. 3,885,261, Cl. 7-14.10R.

Slater, Laurie F., to Bowmar Instrument Corporation. Method of assembly of keyboard switch by ultrasonics. 3,886,012, Cl. 156-73.100.

Slaughter, Philip H., to Creech, Evans S.; Hutchins, Jimmie O.; and Whitley, John W., part interest to each. Woven fourdrinier fabric. 3,885,602, Cl. 139-425.00A.

Slaughter, Philip H., to Creech, Evans S.; Hutchins, Jimmie O.; and Whitley, John W., part interest to each. Papermaking fabric. 3,885,603, Cl. 139-425.00A.

Slebodnick, Robert G., to Westinghouse Electric Corp. Vent condenser for a feedwater heater. 3,885,621, Cl. 165-110.000.

Smith, Billy N., to B. F. Goodrich Company, The. Segmental friction member for brake or clutch. 3,885,659, Cl. 192-107.00R.

Smith, Clarence G., to Mobil Oil Corporation. Seismic trace annotation generator. 3,886,526, Cl. 340-172.500.

Smith, Donald O.: *See—*
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Smith, Frank R., Jr.: *See—*
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Smith, Harry Richard: *See—*
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Smith, Leary W.: *See—*
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Smith, Lynn C.; and Huebscher, Richard G., to Gould Inc. De-energizing system for thermal actuator. 3,886,513, Cl. 337-315.000.

Smith, Robert Samuel, to Digital Equipment Corporation. Method of making a magnetic recording disc. 3,886,052, Cl. 204-33.000.

Smith, Roger M.: *See—*
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Smith, Ronald M.: *See—*
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Smith, William Novis, Jr., to Foote Mineral Company. Dilithio alkane catalyst compositions and method for the preparation thereof. 3,886,089, Cl. 252-429.00R.

Snell, George J., to Lummus Company, The. Sulfate leaching of copper ores using silver catalyst. 3,886,257, Cl. 423-27.000.

Snitzer, Elias, to American Optical Corporation. Solarization resistant glass containing ytterbium oxide. 3,885,976, Cl. 106-52.000.

Snow, Austin Matthew, Jr., to du Pont de Nemours, E. I., and Company. Preparation of fluoroelastomer latex with mixture of mono- and di-esters of phosphoric acid. 3,886,108, Cl. 260-29.60F.

Snowden, Eric McIvor; and Walker, John Hirst, to Dowty Mining Equipment Limited. Mine roof supports. 3,885,396, Cl. 61-45.00D.

Snyder, Richard C.: *See—*
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Sobajima, Norio; and Tonomura, Kenichi, to Hitachi, Ltd. Gain control circuit. 3,886,380, Cl. 307-237.000.

Societa' Italiana per Azioni per la Produzione di Calci e Cementi di Segni: *See—*
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Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
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Societe d'Applications Generales d'Electricite et de Mecanique S A G E M: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
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Societe d'Etudes de Machines Thermiques: *See—*
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Societe Europeenne de Propulsion: *See—*
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Societe Nouvelle des Echafaudages Tubulaires Mills: *See—*
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Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
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Solomon, Elias E.: *See—*
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Solterbeck, Ward W., to American Fine Foods, Inc. Tractor mounted corn harvester. 3,885,375, Cl. 56-15.600.

Solymosi, Frank. Ski instructional device. 3,885,805, Cl. 280-11.13H.

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Somfai, Eva: *See—*
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Soukup, Robert J.: *See—*
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Spanel, Abram N. Hair cutters. 3,885,305, Cl. 30-30.000.

Spencer, Jacob J., to Nortech Laboratories, Inc. Device for use as a hot and cold compress. 3,885,403, Cl. 62-530.000.

Sperry Rand Corporation: *See—*
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Spes, Hellmuth: *See—*
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Spiegel, William; Spiegel, Jacob; and Miller, Albert, 3,885,671.

Spiegel, William; Spiegel, Jacob; and Miller, Albert, to Gilbreth Company, by said Miller. Carded package. 3,885,667, Cl. 206-45.330.

Spiegel, William; Spiegel, Jacob; and Miller, Albert, to Gilbreth Company. Securement of band to card. 3,885,671, Cl. 206-460.000.

Spier, I. Martin: *See—*
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Spiker, James C.: *See—*
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Spilo, Richard A.; Hill, Frank W.; and Hoffman, Larry O., to Gulf & Western Industries, Inc. Traffic controller employing a digital computer. 3,886,496, Cl. 340-41.00R.

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Spitz, Erich: *See—*
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Stabilus GmbH: *See—*
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Stadler, Henry L., to Ford Motor Company. Air-fuel ratio control system for a combustion engine. 3,885,540, Cl. 123-119.00A.

Staebler, Paul J., to Caterpillar Tractor Co. Governor with adjusting means. 3,885,442, Cl. 73-543.000.

Stakhov, Oleg Fedorovich: *See—*
Akimov, Jury Stepanovich; Galaev, Auli Alexandrovich; Gorelik, Semen Samuilovich; Gofman, Boris Izrailevich; Ermoshin, Vya-

cheslav Dmitrievich; Korovin, Stanislav Konstaninovich; Naumov, Vladimir Vasilievich; Preobrazhentsev, Konstantin Andreevich; Fronk, Stanislav Vladislavovich; Shvartsman, Vadim Lvovich; Garshenin, Vladimir Vasilievich; Stakhov, Oleg Fedorovich; Kruglov, Igor Ivanovich; and Samokhvalov, Mark Markovich, 3,886,002.

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Stambler, Abraham M., to Iscar Ltd. Cutting insert with chip control. 3,885,281, Cl. 29-95.00R.

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Stanford Research Institute: *See—*
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Stanley, Charles R.: *See—*
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Stanway, Edward, to United Merchants and Manufacturers, Inc. Apparatus and method for fluid treatment of textile fabric in rope form. 3,885,406, Cl. 68-176.000.

Stark, Ronald. Antifungal Antibiotic. 3,886,271, Cl. 424-115.000.

Statni Vyzkumny ustav Textilni: *See—*
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Staudt, Heinrich; Hofmann, Eberhard; Eckell, Wolfgang; and Knorreck, Peter, to Robert Bosch G.m.b.H. Fuel injection pump for internal combustion engines. 3,885,895, Cl. 417-499.000.

Stauffer Chemical Company: *See—*
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Baker, Don R.; Teach, Eugene G.; and Arneklev, Duane R., 3,885,948.
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Stearns, Richard D., to Eastman Kodak Company. Compensation apparatus for improved microfilm code field reading. 3,885,866, Cl. 353-26.000.

Steckler, Steven Alan, to RCA Corporation. V_{BE} Voltage voltage source temperature compensation network. 3,886,435, Cl. 323-4.000.

Steel Construction & Engineering Co. (Notts.) Limited: *See—*
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Stern, Hansjoerg, to General Electric Company. Fluidic gauging sensor head having a gas bearing material. 3,885,417, Cl. 73-37.700.

Stern, Philip; Green, Sanford; and Goodbar, Isaac. Automatic kaleidoscope. 3,885,865, Cl. 353-2.000.

Stevens, Arthur William, to Monodex Business Systems Limited. Pockets for articles in sheet form. 3,885,841, Cl. 312-183.000.

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Stieler, William E.; and Stieler, Scott M. Mounting device for window draperies. 3,885,268, Cl. 16-94.00D.

Stierli, Robert F.: *See—*
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Stiftelsen Institutet for Mikrovagsteknik Vid Teknishka Hogsk-lan i Stockholm: *See—*
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Stingelin, Valentin, to Battelle Memorial Institute. Method of making sheet glass. 3,885,944, Cl. 65-99.00A.

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Stoeckelmann, Guenter: *See—*
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Stoffel, Donald J., to Eastman Kodak Company. Method and apparatus for processing a film insert on an aperture card. 3,886,576, Cl. 354-317.000.

Stolzenberg, Sidney J.: *See—*
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Stone Container Corporation: *See—*
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Stone, James Edward, to Hoffmann-La Roche Inc. Rotating sampling valve. 3,885,439, Cl. 73-422.0GC.

Stoody Company: *See—*
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Stout, Robert K. Method for making cast-in-place concrete structures. 3,885,296, Cl. 29-433.000.

Stradtmann, Jurgen: *See—*
Obst, Karl-Heinz; Stradtmann, Jurgen; Metz, Paul; and Meyer, Francis, 3,885,956.

Stratford Engineering Corporation: *See—*
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Stratienko, Andrew. Adjustable speed gear drive using multiple cone gearing. 3,885,473, Cl. 74-349.000.

Street, Douglas Brian: *See—*
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Strini, Jean-Claude: *See—*
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Sturgis, Daniel C., to ICI United States Inc. Explosively actuated compressed disc line cutter. 3,885,484, Cl. 83-580.000.

Styhr, Karsten H.: *See—*
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Sugimoto, Tadashi; Nagai, Tyuirito; and Shimoda, Isao, to Fujitsu Limited. Magnet operating time compensation system. 3,885,469, Cl. 101-93.480.

Sugino, Kenji; Mori, Hisataka; and Yamagata, Hironobu, to Sugino Machine Limited. Automatically revolved washing apparatus. 3,885,740, Cl. 239-227.000.

Sugino Machine Limited: *See—*
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Suladze, Ippolit Davidovich: *See—*
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Sulzer Brothers Ltd.: *See—*
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Sumitomo Electric Industries, Limited: *See—*
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Sumner, Elton; and Adams, Aaron W., Jr. Animal feeder construction. 3,885,526, Cl. 119-52.0AF.

Sun Electric Corporation: *See—*
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Sun Oil Company: *See—*
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Sundstrand Corporation: *See—*
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Sussman, E. Donald; and Warner, Andrew, to United States of America, Transportation. Condition responsive control apparatus. 3,886,540, Cl. 340-279.000.

Suter, Hubert; Berger, Rosemarie; Bipp, Hansjoerg; Buerger, Gert; Hauptmann, Kurt; Kratzer, Otto; and Reimer, Willi, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of diesters of dicarboxylic acids with substantial waste water purification. 3,886,199, Cl. 260-475.00B.

Suter, Mark H., to Ford Motor Company. Engine air pump pressure/manifold vacuum controlled exhaust gas recirculating control system. 3,885,538, Cl. 123-119.00A.

Sutton, Alan, to GTE International Incorporated. Telephone exchange signaling system. 3,886,320, Cl. 179-18.00J.

Suzuki, Etsuji: *See—*
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Suzuki, Masahiko, to Casio Computer Co., Ltd. Control device for tabulation printing. 3,885,663, Cl. 197-176.000.

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Suzuki, Takeshi: *See—*
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Swartz, Mark. Engine starter control system. 3,885,543, Cl. 123-179.00B.
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Swearingen, Edith. Protective storm door. 3,885,348, Cl. 49-171.000.
Swiden, Lennart Bror Anders; and Lester, Waldemar. Arrangement for optical scanning of the speed of a rotating device such as a vehicle wheel. 3,886,354, Cl. 250-233.000.
Swift and Company: *See—*
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Swoboda, John J., Jr.; and Swoboda, Norman L. Raching arm for pipe sections, drill collars, riser pipe, and the like used in well drilling operations. 3,885,679, Cl. 214-1.0BD.
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Symons, Robert Spencer, to Varian Associates. Electron beam electrical power transmission system. 3,886,399, Cl. 315-5.000.
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Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,886,181.
Szeliga, Robert, to Culver Tool & Die Co. Machine press for forging bolts and the like. 3,885,411, Cl. 72-342.000.
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Takada, Takezo, to Takata Kojyo Co., Ltd. Selectively engageable three point vehicle safety belt. 3,885,811, Cl. 280-150.0SB.
Takagi, Mikio; Kamioka, Hajime; Nakayama, Kazufumi; and Terada, Chiaki, to Fujitsu Limited. Method of making an integrated circuit. 3,886,003, Cl. 148-187.000.
Takahashi, Kenji: *See—*
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Takahashi, Nobuaki, to Victor Company of Japan, Ltd. Linear voltage controlled oscillator including a timing capacitor charged and discharged through current mirror circuits. 3,886,485, Cl. 331-111.000.
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Taketa, Katsumi; and Takahashi, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Control receiver. 3,886,377, Cl. 307-129.000.
Takeuchi, Takashi: *See—*
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Takeuchi, Takeshi, to Hochiki Corporation. Alarm sending and receiving system incorporated in a catv system. 3,886,538, Cl. 340-310.00R.
Takita, Tomohisa: *See—*
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Tanaka, Hisao: *See—*
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Tanaka, Katsuaki, to Iwasaki Tsushinki Kabushiki Kaisha. Capacitance-voltage converter. 3,886,447, Cl. 324-60.0CD.
Tanaka, Kenichi, to Kakuichi Mfg. Co., Ltd. Reinforced flexible pipe. 3,885,594, Cl. 138-129.000.
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Tanaka, Takashi; Yusa, Haruhiko; and Chubachi, Susumu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing vinyl chloride resin composition. 3,886,232, Cl. 260-876.00R.
Tanaka, Takashi; Yusa, Haruhiko; and Chubachi, Susumu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing vinyl chloride resin composition. 3,886,235, Cl. 260-880.00R.
Tanaka, Teruaki, to Yuasa Battery Company Limited. Apparatus for installing battery vent plug. 3,885,289, Cl. 29-204.00R.
Tandy Corporation: *See—*
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Tatar, Alexander. Method for the sharpening of four faces drills and sharpening machine for carrying out this method. 3,885,925, Cl. 51-122.000.
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Tatsumi, Takeichi; Yoshihara, Hiroshi; and Uesaka, Gaisuke, to Kabushiki Kaisha Denshikagaki. Method for depolymerizing thermoplastic resins by liquid heat transfer media. 3,886,202, Cl. 260-486.00R.
Tatum, Harold E. Speed-setting arrangement for car accelerator pedal. 3,885,450, Cl. 74-513.000.
Taylor, Richard Gerald Meade, to Girling Limited. Automatic adjusters for vehicle brakes. 3,885,652, Cl. 188-196.00D.
Teach, Eugene G.: *See—*
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Baker, Don R.; Teach, Eugene G.; and Arneklev, Duane R., 3,885,948.
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Tetra Tech Incorporated: *See—*
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Theimer, Ernst Theodore; and Roslonski, Donald Joseph, to National Electro-Cook Corporation. Electrode type cooking package. 3,886,290, Cl. 426-107.000.
Thibeault, Ronald N., to Sola Basic Industries, Inc. Grounding clip with wrap-around tabs. 3,885,847, Cl. 339-14.00R.
Thiokol Corporation: *See—*
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Thomas, Paul D., to Pfizer Inc. Starch compositions containing salts of certain monoalkyl fumarates and maleates. 3,885,981, Cl. 106-210.000.

Thomas, Royal David, Jr.; and Norcross, James E., to Arcos Corporation. Pressure vessel and bimetallic components. 3,885,922, Cl. 29-191.000.

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Thornley, Gary M.; and Udy, Lex L., to Ireco Chemicals. Stabilized and aerated blasting slurry containing thiourea and a nitrite gassing agent. 3,886,010, Cl. 149-60.000.

Throndson, Lester W., to Rockwell International Corporation. Compound ejector. 3,885,891, Cl. 417-196.000.

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Tihanyi, Jenoe, to Siemens Aktiengesellschaft. Method for production of p-channel field effect transistors and product resulting therefrom. 3,885,993, Cl. 148-1.500.

Tischlinger, Edward A., to MPL, Inc. Method of assembling glass tube and thermoplastic resin finger grip and nose sleeve syringe body. 3,885,297, Cl. 29-450.000.

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Tong, Duncan, to Playart Limited. Stands for model aircraft. 3,885,344, Cl. 46-44.000.

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Topolyansky, Jury Arnoldovich: *See—*
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Toussan, Michel, to Societe d'Applications Generales d'Electricite et de Mecanique S A G E M. Flexible disc memory devices. 3,886,594, Cl. 360-102.000.

Townes, William E., Jr.; and Svedeman, Stanley P., to Texas Instruments Incorporated. Radar antenna and method of fabricating same. 3,886,557, Cl. 343-912.000.

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Townsend, Ray T., to Townsend Engineering Company. Rotary internal combustion engine and method of controlling the combustion thereof. 3,885,533, Cl. 123-44.00E.

Toyo Glass Company Ltd.: *See—*
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Trondheim, Olav Erga. Process for purification of aqueous sodium citrate solutions. 3,886,069, Cl. 210-46.000.

Troope, Walter S., to Cluett, Peabody & Co., Inc. Apparatus for mixing volatile liquid with nonvolatile material. 3,885,587, Cl. 137-391.000.

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Trujillo, Ralph E., to United States of America, Energy Research and Development Administration. Process for preparing odor and irritation free formaldehyde disinfectant. 3,886,269, Cl. 424-82.000.

Trumbull, Walter A.; and Schlosser, James A., to Dow Chemical Company, The. Tubing connector. 3,885,820, Cl. 285-137.00R.

Trussell, Gerald C.; and Caruth, James R., to Sun Electric Corporation. Wireless portable tachometer. 3,886,450, Cl. 324-170.000.

TRW Inc.: *See—*
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Tsunekawa, Tokuichi; Nakamoto, Soichi; Taguchi, Tetsuya; and Kiyohara, Takehiko, to Canon Kabushiki Kaisha. Light sensing device with auxiliary illumination. 3,885,880, Cl. 356-226.000.

Tsuruzawa, Teruya; and Ueda, Muneyuki, to Nippon Seal Co., Ltd. Cleaning brush with dust removing and collecting means. 3,885,264, Cl. 15-185.000.

Tsuyuki, Tadaharu: *See—*
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Tuinila, Raymond P., to Raytheon Company. Collector electrode. 3,886,384, Cl. 313-39.000.

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Tung, Chi Fang, to Minnesota Mining and Manufacturing Company. Retroreflective protective helmet. 3,885,246, Cl. 2-3.00R.

Tuohey, Paul F.: *See—*
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Turbak, Albin F.: *See—*
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Tuttle, Phillip E. Pressure fluid cleaning device. 3,885,739, Cl. 239-124.000.

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Chesmel, David M.; and Spier, I. Martin, 3,885,738.
West, James I. Incinerating commode. 3,885,254, Cl. 4-131.000.
Westbert, J. Eric H. Centrifuge apparatus. 3,885,735, Cl. 233-25.000.
Westenrieder, Irmgard M. Combined stacking ring and container cover. 3,885,672, Cl. 206-503.000.
Wester, Kaj Dennis Georg, to Telefonaktiebolaget L M Ericsson. Device for contactless positional indication. 3,886,361, Cl. 250-338.000.
Western Electric Company, Incorporated: *See—*
Hacker, Joseph Michael, 3,885,380.
Maddox, Harry L., 3,886,486.
Westinghouse Electric Corporation: *See—*
Cameron, Frank L.; and Iandola, Robert C., 3,886,512.
Cohen, Albert; Burckhalter, Frank O.; and Luongo, Michael C., 3,885,822.
Egelston, David M.; and Russell, Jerry C., 3,886,330.
Guldberg, Jens; and Nathanson, Harvey C., 3,886,310.
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Jones, Charles H., 3,886,489.
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Ordonez, Carlos R., 3,885,938.
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Putman, Thomas H.; and Osbon, William O., 3,885,836.
Slebodnick, Robert G., 3,885,621.
Weston, Clement Walker, Jr. Setworks control for sawmill. 3,885,487, Cl. 83-728.000.
Westvaco Corporation: *See—*
Brugh, Latane D., Jr.; and Smith, John W., Jr., 3,886,017.
Dimitri, Mitchell S., 3,886,093.
Wheatley, Carl Franklin, Jr., to RCA Corporation. Bias circuitry for stacked transistor power amplifier stages. 3,886,466, Cl. 330-15.000.
Wheeler, John H. Packing member for automobile lift. 3,885,802, Cl. 277-212.000.
Wheelock, Thomas D.: *See—*
Nikolai, William L., Jr.; and Wheelock, Thomas D., 3,886,259.
Whitaker, Ralph, to Fred Whitaker Company. Apparatus for texturing yarn. 3,885,278, Cl. 28-1.300.
White, Herbert Montgomery, to John Joseph Szmigielski, a part interest. Sonic insect repeller. 3,886,492, Cl. 340-15.000.
Whitehouse, David John; Mowbray, Melton; and Spragg, Robert Claude, to Rank Organisation Limited, The. Surface profile testing instrument. 3,885,318, Cl. 33-174.00L.
Whitewater Mfg. Co.: *See—*
Carpentier, John H., 3,885,585.
Whitley, John W.: *See—*
Slaughter, Philip H., 3,885,602.
Slaughter, Philip H., 3,885,603.
Whitney, Thomas A.; and Langer, Arthur W., to Exxon Research and Engineering Company. Preparation of aromatic compounds via benzyne intermediates. 3,886,193, Cl. 260-440.000.
Whittaker Corporation: *See—*
Chase, Vance A., 3,886,024.
Whittey, Richard W., to Korfil, Incorporated. Insulated block. 3,885,363, Cl. 52-125.000.
Whittle, Albert: *See—*
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Widmark, Gustaf: *See—*
Grunbaum, Gunnar; Wallen, John Erik; Gustafsson, John Kjell; and Widmark, Gustaf, 3,885,958.
Wiens, Jacob H.: *See—*
Davenport, Alvan F.; Gerken, Ralph F.; and Wiens, Jacob H., 3,885,324.
Wilcox, Paul D., to United States of America, Energy Research and Development Administration. Thermocouple and method of making same. 3,885,992, Cl. 136-212.000.
Wilder, Hulen L.: *See—*
Schutze, Henry G.; and Wilder, Hulen L., 3,886,105.
Wilke, Guenther; and Heimbach, Paul, to Studiengesellschaft Kohle GmbH. Process for the catalytic oligomerization of 1,3-diolefins to form open-chain compounds. 3,886,225, Cl. 260-677.00R.
Wilkinson, David B., to United States of America, Air Force. Apparatus for providing an aerodynamic window. 3,885,884, Cl. 415-53.000.
Wilkinson, Robert M.; and Lyon, James R., to Alton Box Board Company. Method of making laminated corrugated paperboard. 3,886,019, Cl. 156-210.000.
Willard, Miles J. Expanded fried potato snack product. 3,886,291, Cl. 426-637.000.
Williams, Donald N., to United States of America, Navy. Optical-to-electronic interface circuit. 3,886,351, Cl. 250-206.000.
Williams, Edward: *See—*
Edwards, Michael Frederick; and Williams, Edward, 3,885,834.
Williams, Penelope. Device for threading a ribbon through a hem. 3,885,719, Cl. 223-103.000.
Williams, Robert A.: *See—*
Naylor, Hugh E., III; and Williams, Robert A., 3,886,564.
Williamson, Donald E., to Cordis Corporation. Flowmeter. 3,885,434, Cl. 73-194.00B.
Williamson, Herschel M.: *See—*
Crisp, Chester A.; and Williamson, Herschel M., 3,885,461.
Wilson, Clarence C.: *See—*
Wilson, Lester W.; Tracy, Joseph H.; and Wilson, Clarence C., 3,885,676.
Wilson, John Charles, to Eastman Kodak Company. Condensant and polyesters and polyurethanes prepared from hydroxymethylphenylindans. 3,886,124, Cl. 260-77.5AP.
Wilson, Lester W.; Tracy, Joseph H.; and Wilson, Clarence C., to Wilson, Lester W.; and Wilson, Clarence C. Crane system for cargo containers. 3,885,676, Cl. 212-44.000.
Wilson, Robert E., to RCA Corporation. Pulse position discriminator. 3,886,460, Cl. 328-109.000.
Wilson, Walter: *See—*
Moss, James R.; and Wilson, Walter, 3,885,747.
Wilwerding, Dennis J., to Honeywell Inc. Stable threshold circuit. 3,886,437, Cl. 323-8.000.
Winkle, Gunther; Molzer, Peter; Otto, Peter H.; and Zurek, Rudolf, to Krauss-Maffei Aktiengesellschaft. Track for magnetic-suspension vehicle. 3,885,505, Cl. 104-148.0LM.
Winter, Roland A. E.; and Villani, Thomas J., to Ciba-Geigy Corporation. 5,6,8,8B,9-Pentaazanaphth[3,2,1-d,e]anthracene derivatives. 3,886,157, Cl. 260-256.40F.

Wipkink, Johannes; Van Holst, Marinus; and Wolters, Johan Gerhard, to Ingenieursbureau Marcon (Marine Consultants) B.V.; and Scheepsbouwbelangen B.V. Float drilling platform or similar floating structure. 3,885,511, Cl. 114-.50D.

Wirth, Gallo and Company: *See*—
Melcher, Domenic; and Gallo, Mario, 3,885,427.

Wise, David Richard: *See*—
Rollett, John Mortimer; and Wise, David Richard, 3,886,469.

Witt, Donald L.; and Staley, Charles F., to United Aircraft Corporation. Multi-stage system. 3,886,476, Cl. 331-94.50G.

Witt, Donald L.: *See*—
Ruby, Lowell E.; Witt, Donald L.; and Staley, Charles F., 3,886,477.

Witt, Karel; and Trepp, Christian, to Sulzer Brothers Ltd. Process and apparatus for treating and utilizing vaporized gas in a ship for transporting liquified gas. 3,885,394, Cl. 60-651.000.

Witte, Fritz; and Bockstiegel, Heinrich, to Mannesmannrohren Werke Aktiengesellschaft. Method and apparatus for ultrasonic testing of tubes and rods. 3,885,419, Cl. 73-67.50R.

Witte, Roy; Kirby, Edward; and Mack, George, to TRW Inc. Controlled retention force connector with detent. 3,885,850, Cl. 339-91.00R.

Wittwer, Gladys Ann. Dispensing apparatus for toothpaste dentifrice and other flowable viscous- material. 3,885,707, Cl. 222-96.000.

Witzke, Arthur E.: *See*—
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Wohlfarth, Ernst: *See*—
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Wolf, Klaus: *See*—
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Wolfinger, John F., to General Electric Company. Method and apparatus for measuring small variations in the speed of rotating shafts. 3,885,420, Cl. 73-70.100.

Wolfinger, John F., to General Electric Company. Power measurement circuit. 3,886,449, Cl. 324-142.000.

Wolters, Johan Gerhard: *See*—
Wipkink, Johannes; Van Holst, Marinus; and Wolters, Johan Gerhard, 3,885,511.

Wolz, Hermann: *See*—
Ehrig, Bodo; Wolz, Hermann; and Hentschel, Claus, 3,885,950.

Wong, Shi-Yin: *See*—
Farnsworth, Robert P.; Hill, Lowell W.; and Wong, Shi-Yin, 3,885,861.

Wooley, Richard L.: *See*—
Hassencahl, Lloyd J.; Chernick, Leon; Jonokuchi, James N.; Katz, Joel; and Wooley, Richard L., 3,886,461.

Wright, Andrew Charles Walden, to Girling Limited. Vehicle wheel brake actuators. 3,885,458, Cl. 92-52.000.

Wright, David D.; and Hawkes, Ivor, to Xerox Corporation. Sheet feeder. 3,885,782, Cl. 271-10.000.

Wright, John B., to Upjohn Company, The. Quinolyl oxamic acids. 3,886,164, Cl. 260-287.00R.

Wright, John H., to General Electric Company. Methyl alkyl silicone thermoconducting compositions. 3,885,984, Cl. 106-287.0SB.

Wu, Hsin Chih, to Standard Oil Company, The. Acrylonitrile and methacrylonitrile recovery and purification system. 3,885,928, Cl. 55-85.000.

Wu, Yao Hua; and Ryan, Richard P., Jr., to Mead Johnson & Company. Indolylimidoylheterocyclics. 3,886,165, Cl. 260-288.00R.

Wutka, Anthony D.: *See*—
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Xenex Corporation: *See*—
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Xerox Corporation: *See*—
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Yagi, Norio; Okai, Hiroshi; Fukuda, Makoto; and Kishi, Ikuji, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for preparing aromatic polymer and product thereof. 3,886,120, Cl. 260-49.000.

Yagi, Norio; Okai, Hiroshi; Fukuda, Makoto; and Kishi, Ikuji, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for preparing aromatic polyethers. 3,886,121, Cl. 260-49.000.

Yaginuma, Hiroshi: *See*—
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Yale, Harry Louis; and Petigara, Ramesh B., to E. R. Squibb & Sons, Inc. 6H-pyrimido[1,2-c][1,3,5] benzoxadiazepines. 3,886,158, Cl. 260-256.40F.

Yale, Harry Louis, to E. R. Squibb & Sons, Inc. Method for reducing hypertension by use of derivatives of 1,2,4-benzothiadiazine-4-carboxaldehyde-1,1-dioxide. 3,886,275, Cl. 424-246.000.

Yamada, Keijyo: *See*—
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Yamamoto, Shin: *See*—
Chiku, Takewo; Yamamoto, Shin; and Huruhashi, Mikio, 3,886,442.

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Yardley, John P., to American Home Products Corporation. P-Glu-D-Phe-Trp-Ser-Tyr-D-Leu-Leu-Arg-Pro-Gly-NH_2 and intermediates. 3,886,137, Cl. 260-112.500.

Yarrington, James C.: *See*—
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Yasuda, Yoshizo; Hatano, Itaru; Suganuma, Yasuyuki; and Kameo, Tomohumi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of manufacturing polymer particles having uniform cross-linking and expanded shaped articles obtained therefrom. 3,886,100, Cl. 260-2.50B.

Yazaki, Mutsunobu; Mashimo, Yukio; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Photographic camera with automatic exposure control means. 3,886,568, Cl. 354-27.000.

Yeiser, Beverly G.: *See*—
Powell, James B.; Yeiser, Beverly G.; and Lightner, Joseph R., 3,885,525.

Yew, Nelson C.; and Colby, David H., to Etec Corporation. Automatic contrast and dark level control for scanning electron microscopes. 3,886,305, Cl. 178-6.800.

Yokokura, Kunio, to Sony Corporation. Drive assembly for phonograph record player. 3,885,798, Cl. 274-10.00R.

York, Albert Garnett, to New Zealand Inventions Development Authority. Method of controlling the movement of pelagic fish and/or signaling apparatus use therefor. 3,885,338, Cl. 43-17.100.

Yoshida Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Akira, 3,885,275.

Yoshihara, Hiroshi: *See*—
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Yoshikawa, Takashi: *See*—
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Yoshimura, Hikoji; Nakagawa, Yuji; Yaginuma, Hiroshi; and Kimi, Atsutane, to Nippon Zeon Co., Ltd. Hardenable compositions. 3,886,111, Cl. 260-31.20N.

Yoshinaga, Fumihiro; Tsuchida, Takayasu; Kikuchi, Kenji; and Okumura, Shinji, to Ajinomoto Co., Inc. Method for producing L-glutamine. 3,886,039, Cl. 195-29.000.

Yoshioka, Takao: *See*—
Murayama, Keisuke; Morimura, Syoji; Yoshioka, Takao; Horiuchi, Hideo; Matsui, Katsuaki; Kurumada, Tomoyuki; Ohta, Noriyuki; and Ohsawa, Hisayou, 3,886,115.

Young, Thomas Benton; and Koplove, H. Michael, to E. R. Squibb & Sons, Inc. Recycle fermentation process. 3,886,046, Cl. 195-115.000.

Yuasa Battery Company Limited: *See*—
Tanaka, Teruaki, 3,885,289.

Yusa, Haruhiko: *See*—
Tanaka, Takashi; Yusa, Haruhiko; and Chubachi, Susumu, 3,886,232.
Tanaka, Takashi; Yusa, Haruhiko; and Chubachi, Susumu, 3,886,235.

Zachary, La Wanda M. Canvas Stretcher. 3,885,333, Cl. 38-102.200.

Zahradka, Pavel; Hrabanek, Jiri; and Petranek, Milan, to ELITEX, Zavody textilniho strojirenstvi, generalni reditelstvi. Apparatus for patterning knitting machines. 3,885,404, Cl. 66-50.00R.

Zaidon Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Takita, Tomohisa; Fujii, Akio; and Fukuoka, Takeyo, 3,886,133.

Zanetti, Guido: *See*—
Furlenmeier, Andre; Lanz, Paul; Vogler, Karl; and Zanetti, Guido, 3,886,142.

Zanoni, Carl A.: *See*—
Rosenfeld, Alvin H.; and Zanoni, Carl A., 3,885,875.

Zaslavsky, Mikhail Maximovich: *See*—
Goppen, Albert Adolfovich; Nikolaev, Igor Vladimirovich; Vysotsky, Iosif Fadeevich; Zaslavsky, Mikhail Maximovich; Klushin, Nikolai Alexandrovich; Petreev, Anatoly Mikhailovich; Dronova, Lidia Mikhailovna; Lednikov, Anatoly Ivanovich; Grishenkov, Jury Alexandrovich; and Bashlykov, Jury Mikhailovich, 3,885,634.

Zech, John D., to ICI United States Inc. Food products containing surfactants. 3,886,293, Cl. 426-553.000.

Zellweger Uster AG: *See*—
Forgo, Gabor; Meyer, Erwin; and Moser, Karl, 3,886,563.

Zmatlik, Josef; Jisa, Miloslav; and Mohelnicky, Josef, to Statni Vyzkumny ustav Textilni. Knit-woven fabric and a machine for making the same. 3,885,601, Cl. 139-383.00R.

Zollenkopf, Hans M., to Raymond Lee Organization, Inc., The, a part interest. Rotary internal combustion engine. 3,885,531, Cl. 123-8.450.
Zurek, Rudolf: *See*—
Winkle, Gunther; Molzer, Peter; Otto, Peter H.; and Zurek, Rudolf, 3,885,505.
Zygo Corporation: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF MAY, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and of the original registrations.

Alling, Richard L., and R. L. Iffland, to The Torrington Co. Lanced tab race. Re. 28,431, 5-27-75, Cl. 308—235.

Auto Research Corp.: *See*—
Reeve, Paul H. Re. 28,428.

Ballentine, John W., and F. R. Chaffin, to W. S. Shamban, & Co. Lead screw and nut. Re. 28,429, 5-27-75, Cl. 74—24.

Chaffin, Frank R.: *See*—
Ballentine, John W., and Chaffin. Re. 28,429.

Iffland, Roger L.: *See*—
Alling, Richard L., and Iffland. Re. 28,431.

Ketterling, Edwin: *See*—
Ronayne, Ronald J., and Ketterling. Re. 28,433.

Kusama, Mitsuru: *See*—
Mukai, Eitaro, Murase, Kusama, Yamasaki, Takasago, and Tanabe. Re. 28,430.

Mukai, Eitaro, Y. Murase, M. Kusama, M. Yamasaki, T. Takasago, and T. Tanabe, to Teijin Ltd. Apparatus for detecting broken yarn in synthetic fiber spinning. Re. 28,430, 5-27-75, Cl. 425—169.

Murase, Yasuhiro: *See*—
Mukai, Eitaro, Murase, Kusama, Yamasaki, Takasago, and Tanabe. Re. 28,430.

Olsen, Charles R. Actuator. Re. 28,434, 5-27-75, Cl. 60—632.

Reeve, Paul H., by Auto Research Corp., to Auto Research Corp. Pump priming and flow control valve for pumping two different fluids. Re. 28,428, 5-27-75, Cl. 417—295.

Rohr Industries, Inc.: *See*—
Ross, James A. Re. 28,432.

Ronayne, Ronald J., and E. Ketterling, to White Farm Equipment Co. Power take-off control valve. Re. 28,433, 5-27-75, Cl. 192—12.

Ross, James A., to Rohr Industries, Inc. Class D linear audio amplifier. Re. 28,432, 5-27-75, Cl. 330—207.

Shamban, W. S., & Co.: *See*—
Ballentine, John W., and Chaffin. Re. 28,429.

Takasago, Takayuki: *See*—
Mukai, Eitaro, Murase, Kusama, Yamasaki, Takasago, and Tanabe. Re. 28,430.

Tanabe, Tatsumi: *See*—
Mukai, Eitaro, Murase, Kusama, Yamasaki, Takasago, and Tanabe. Re. 28,430.

Teijin Ltd: *See*—
Mukai, Eitaro, Murase, Kusama, Yamasaki, Takasago, and Tanabe. Re. 28,430.

Torrington, Co., The: *See*—
Alling, Richard L., and Iffland. Re. 28,431.

White Farm Equipment Co.: *See*—
Ronayne, Ronald J., and Ketterling. Re. 28,433.

Yamasaki, Misturu: *See*—
Mukai, Eitaro, Murase, Kusama, Yamasaki, Takasago, and Tanabe. Re. 28,430.

LIST OF PLANT PATENTEES

Heard, William R. Black maple tree. 3,722, 5-27-75, Cl. 51.
Mikkelsen, James C. Begonia plant. 3,723, 5-27-75, Cl. 68.

LIST OF DESIGN PATENTEES

Ainslie, Dianne B., and A. Hunt, to Eastman Kodak Co. Film reel or the like. 235,223, 5-27-75, Cl. D61—1.

Achenbach, Walter B., to Owens-Illinois, Inc. Canister or similar article. 235,184, 5-27-75, Cl. D7—79.

Achenbach, Walter B., to Owens-Illinois, Inc. Canister with lid or similar article. 235,185, 5-27-75, Cl. D7—79.

Achenbach, Walter B., to Owens-Illinois, Inc. Canister with lid or similar article. 235,186, 5-27-75, Cl. D7—79.

Achenbach, Walter B., to Owens-Illinois, Inc. Canister lid or similar article. 235,187, 5-27-75, Cl. D7—131.

Achenbach, Walter B., to Owens-Illinois, Inc. Packaged set of beverage glasses 235,194, 5-27-75, Cl. D9—193.

Auer, Robert T.: *See*—
Lohr, Raymond J., Campbell, and Auer. 235,217.

Baughman, Karl T., to Sears, Roebuck & Co. Calculator with sliding tambour cover. 235,209, 5-27-75, Cl. D26.

Berger, Leonard, and T. H. P. Jaggers, Jr., to Rapid-American Corp. Gloves. 235,175, 5-27-75, Cl. D2—373.

Bernard, Charles. Chair. 235,179, 5-27-75, Cl. D6—67.

Bertrand, Thomas R., to P.F.C. Financial Corp. Counter top water filter. 235,206, 5-27-75, Cl. D23.

Braun, Werner, to Interelectric Aktiengesellschaft. Reusable coffee-filter. 235,183, 5-27-75, Cl. D7—47.

Brown, Eugene. Shelving. 235,181, 5-27-75, Cl. D6—114.

Campbell, Laurie J.: *See*—
Lohr, Raymond J., Campbell, and Auer. 235,217.

Capron, Rosewell G. Sugar container with measuring and dispensing spout. 235,182, 5-27-75, Cl. D7—17.

Cleary, John M, and J. P. Mohrhauser, to Cleary Machinery Co., Inc. Light. 235,227, 5-27-75, Cl. D48—20.

Cleary Machinery Co., Inc.: *See*—
Cleary, John M., and Mohrhauser. 235,227.

Colibri Lighters Ltd.: *See*—
Retzler, William. 235,214.

Cormier, Yves. Photocopier cabinet. 235,221, 5-27-75, Cl. D61—1.

Cross, Walter A. Timer controlled dual thermostat. 235,197, 5-27-75, Cl. D10—51.

Curcio, Louis: *See*—
Di Venero, John A., and Curcio. 235,207.

Deschamps, Robert L., to Shure Brothers Inc. Phonograph cartridge. 235,211, 5-27-75, Cl. D26—14.

Dimicell, Joseph W. Utility pole shelf channel gain. 235,191, 5-27-75, Cl. D8—230.

Di Venero, John A., and L. Curcio, to Northwood, Inc. Wall panel. 235,207. 5-27-75, Cl. D23—69.

Duhy, Kenneth W., and J. Jones, Jr., to Pfizer Inc. Dispensing container for folded disposable towels. 235,196, 5-27-75, Cl. D9—224.

Dyno Merchandise Corp.: *See*—
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Eastman Kodak Co.: *See*—
Ainslie, Dianne B., and Hunt. 235,223.

Edwards, Bryant, to Illinois Tool Works Inc. Food jar or the like. 235,193, 5-27-75, Cl. D8—140.

Educational Design Associates: *See*—
Root, Charles B. 235,204.

Efficiency Dispensers Corp.: *See*—
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Schwartz, Daniel A., and Fasulo. 235,205.

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Fisher, Morris F., to Mohasco Corp. Chair. 235,178, 5-27-75, Cl. D6—59.

Gardner, Lee R., to Dyno Merchandise Corp. Hem marker. 235,174, 5-27-75, Cl. D3—19.

General Electric Co.: *See*—
Noroski, William J., and Schilling. 235,212.

Gilbert, Evalin S. Chair. 235,180, 5-27-75, Cl. D6—68.

Hamada, Masanori, and B. Mishiro, to Matsushita Electrical Industrial Co., Ltd. Radio receiver. 235,229, 5-27-75, Cl. D56—4.

Harper, Claude M., to Roto-Master, Inc. Turbo-teardown swivel fixture. 235,219, 5-27-75, Cl. D54—13.

Hazzard, Robert C.: *See*—
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Herr, Lewis H., and J. S. Kovacs, to Sperry Univac Division Sperry Rand Corp. Electrostatic copier. 235,230, 5-27-75, Cl. D61—1.

Hill, Oliver, to The Rank Organisation Ltd. Headphones. 235,210, 5-27-75, Cl. D26—14.

Humlong, Robert F.: *See*—
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Hunt, Arthur: *See*—
Ainslie, Dianne B., and Hunt. 235,223.

Illinois Tool Works Inc.: *See*—
Edwards, Bryant. 235,193.

Interelectric Aktiengesellschaft: *See*—
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Jaggers, Thomas H. P., Jr.: *See*—
Berger, Leonard, and Jaggers. 235,175.

Jones, John, Jr.: *See*—
Duhy, Kenneth W., and Jones. 235,196.

Jones, Mary A. Puzzle toy. 235,218, 5-27-75, Cl. D34—15.

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CLASSIFICATION OF PATENTS

ISSUED MAY 27, 1975

NOTE.—First number, class; second number, subclass; third number, patent number

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521 3,886,032
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215 3,885,616

CLASS 161
26 3,885,619

CLASS 162
49 3,886,034
55 3,886,035
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305 3,885,618

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32 3,885,620
110 3,885,621
179 3,885,622

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CLASS 182
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196D 3,885,652
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284 3,885,654

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224M 3,886,059

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503 3,885,672

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354 3,886,062

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157 3,886,064

CLASS 210
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46 3,886,069
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768 3,885,694

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6	235,191	17	235,192	18	235,177		235,224		235,174		235,194
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	235,201		235,198		235,178		235,215		235,212		235,228
	235,205		235,206		235,218	34	235,175		235,223	40	235,217
	235,219		235,206		235,226		235,196	39	235,184	42	235,230
	235,222		235,209	20	235,203		235,204		235,185	45	235,232
8	235,176		235,209	21	235,202		235,227		235,185	48	235,216
9	235,207		235,211	22	235,199		235,227		235,186	55	235,195
	235,213		235,220								

PLANT PATENTS

19	3,722	39	3,723								

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

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